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Deni S.  
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(FILE 'HCAPLUS' ENTERED AT 09:48:00 ON 07 OCT 2002)

L1 3402 SEA FILE=HCAPLUS ABB=ON PLU=ON ALS1? OR ALSI? OR  
ALS(S)AGGLUTIN? OR AGGLUTIN?(W)LIKE  
L2 23 SEA FILE=HCAPLUS ABB=ON PLU=ON L1 AND (CANDIDA OR  
ALBICANS OR KRUSEI OR TROPICALIS OR PARAPSILOS?)

L2 ANSWER 1 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2002:712015 HCAPLUS  
TITLE: Adhesion in *Candida* spp  
AUTHOR(S): Sundstrom, Paula  
CORPORATE SOURCE: Department of Molecular Virology, Immunology and  
Medical Genetics, and the Department of  
Microbiology, The Ohio State University College  
of Medicine, Columbus, OH, 43210-1239, USA  
SOURCE: Cellular Microbiology (2002), 4(8), 461-469  
CODEN: CEMIF5; ISSN: 1462-5814  
PUBLISHER: Blackwell Science Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Microbial adherence is one of the most important determinants of  
pathogenesis, yet very few adhesins have been identified from fungal  
pathogens. Four structurally related adhesins, Hwp1, Als1p/Als5p,  
Als1p, from *Candida albicans* and Epalp  
from *Candida glabrata*, are members of a class of proteins  
termed glycosylphosphatidylinositol-dependent cell wall proteins  
(GPI-CWP). These proteins have N-terminal signal peptides and  
C-terminal features that mediate glycosylphosphatidylinositol (GPI)  
membrane anchor addn., as well as other determinants leading to  
attachment to cell wall glucan. While common signalP/GPI motifs  
facilitate cell surface expression, unique features mediate ligand  
binding specificities of adhesins. The first glimpse of structural  
features of putative adhesins has come from biophys.  
characterizations of the N-terminal domain of Als5p. One protein  
not in the GPI-CWP class that was initially described as an adhesin,  
Int1p, has recently been shown to be similar to Bud4p of  
*Saccharomyces cerevisiae* in primary amino acid sequence, in  
co-localizing with septins and in functioning in bud site selection.  
Progress in understanding the role of adhesins in oroesophageal  
candidiasis has been made for Hwp1 in a study using beige athymic  
and transgenic .epsilon.26 mice that have combined defects in innate  
and acquired immune responses. Searches of the *C. albicans*  
genome for proteins in the GPI-CWP class has led to the  
identification of a subset of genes that will be the focus of future  
efforts to identify new *Candida* adhesins.  
REFERENCE COUNT: 51 THERE ARE 51 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L2 ANSWER 2 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2002:639230 HCAPLUS  
TITLE: Contribution of *Candida*  
*albicans* ALS1 to the  
pathogenesis of experimental oropharyngeal  
candidiasis  
AUTHOR(S): Kamai, Yasuki; Kubota, Mikie; Kamai, Yoko;  
Hosokawa, Tsunemichi; Fukuoka, Takashi; Filler,  
Scott G.  
CORPORATE SOURCE: Biological Research Laboratories, Sankyo Co.,

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SOURCE: Ltd., Tokyo, 140-8710, Japan  
Infection and Immunity (2002), 70(9), 5256-5258  
CODEN: INFIBR; ISSN: 0019-9567  
PUBLISHER: American Society for Microbiology  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB We investigated the contribution of *Candida albicans* **ALS1**, which encodes a candidal adhesin, to the pathogenesis of exptl. murine oropharyngeal candidiasis. Our results indicate that the **ALS1** gene product is important for the adherence of the organism to the oral mucosa during the early stage of the infection.  
REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 3 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2002:355852 HCPLUS  
DOCUMENT NUMBER: 137:90678  
TITLE: *Candida albicans*  
AUTHOR(S): *Als1p*: An adhesin that is a downstream effector of the EFG1 filamentation pathway  
Fu, Yue; Ibrahim, Ashraf S.; Sheppard, Donald C.; Chen, Yee-Chun; French, Samuel W.; Cutler, Jim E.; Filler, Scott G.; Edwards, John E., Jr.  
CORPORATE SOURCE: Division of Infectious Diseases, St John's Cardiovascular Research Center, Harbor-UCLA Research and Education Institute, Torrance, CA, 90502, USA  
SOURCE: Molecular Microbiology (2002), 44(1), 61-72  
CODEN: MOMIEE; ISSN: 0950-382X  
PUBLISHER: Blackwell Science Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Filamentation and adherence to host cells are crit. virulence factors of *Candida albicans*. Multiple filamentation regulatory pathways have been discovered in *C. albicans* using *Saccharomyces cerevisiae* as a model. In *S. cerevisiae*, these pathways converge on *Flo11p*, which functions as a downstream effector of filamentation and also mediates cell-cell adherence (flocculation). In *C. albicans*, such effector(s) have not yet been identified. Here, we demonstrate that the cell surface protein *Als1p* is an effector of filamentation in *C. albicans*. We show that *Als1p* expression is controlled by the transcription factor *Efg1p*, which is known to be a key regulator of filamentation in *C. albicans*. Further, disruption of **ALS1** inhibited filamentation, and autonomous expression of *Als1p* restored filamentation in an *eef1* homozygous null mutant. Thus, *Als1p* functions as a downstream effector of the EFG1 filamentation pathway. In addn., we found that *Als1p* mediates both flocculation and adherence of *C. albicans* to endothelial cells in vitro. As a cell surface glycoprotein that mediates filamentation and adherence, *Als1p* has both structural and functional similarity to *S. cerevisiae* *Flo11p*. Consistent with our in vitro results, *Als1p* was required for both normal filamentation and virulence in the mouse model of hematogenously disseminated candidiasis.

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REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 4 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2001:893299 HCAPLUS  
DOCUMENT NUMBER: 136:196745  
TITLE: Transcript profiling in *Candida albicans* reveals new cellular functions for the transcriptional repressors CaTup1, CaMig1 and CaNrg1  
AUTHOR(S): Murad, A. Munir A.; D'Enfert, Christophe; Gaillardin, Claude; Tournu, Helene; Tekaia, Fredj; Talibi, Driss; Marechal, Daniel; Marchais, Veronique; Cottin, Jane; Brown, Alistair J. P.  
CORPORATE SOURCE: Molecular and Cell Biology, Institute of Medical Sciences, University of Aberdeen, Aberdeen, AB25 2ZD, UK  
SOURCE: Molecular Microbiology (2001), 42(4), 981-993  
PUBLISHER: CODEN: MOMIEE; ISSN: 0950-382X  
DOCUMENT TYPE: Blackwell Science Ltd.  
LANGUAGE: Journal English

AB The pathogenic fungus, *Candida albicans* contains homologues of the transcriptional repressors ScTup1, ScMig1 and ScNrg1 found in budding yeast. In *Saccharomyces cerevisiae*, ScMig1 targets the ScTup1/ScSsn6 complex to the promoters of glucose repressed genes to repress their transcription. ScNrg1 is thought to act in a similar manner at other promoters. We have exmd. the roles of their homologues in *C. albicans* by transcript profiling with an array contg. 2002 genes, representing about one quarter of the predicted no. of open reading frames (ORFs) in *C. albicans*. The data revealed that CaNrg1 and CaTup1 regulate a different set of *C. albicans* genes from CaMig1 and CaTup1. This is consistent with the idea that CaMig1 and CaNrg1 target the CaTup1 repressor to specific subsets of *C. albicans* genes. However, CaMig1 and CaNrg1 repress other *C. albicans* genes in a CaTup1-independent fashion. The targets of CaMig1 and CaNrg1 repression, and phenotypic analyses of nrg1/nrg1 and mig1/mig1 mutants, indicate that these factors play differential roles in the regulation of metab., cellular morphogenesis and stress responses. Hence, the data provide important information both about the modes of action of these transcriptional regulators and their cellular roles.

REFERENCE COUNT: 65 THERE ARE 65 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 5 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2001:658968 HCAPLUS  
DOCUMENT NUMBER: 135:341382  
TITLE: Biofilm formation by the fungal pathogen *Candida albicans*: development, architecture, and drug resistance  
AUTHOR(S): Chandra, Jyotsna; Kuhn, Duncan M.; Mukherjee, Pranab K.; Hoyer, Lois L.; McCormick, Thomas; Ghannoum, Mahmoud A.

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CORPORATE SOURCE: Center for Medical Mycology, University Hospitals of Cleveland, Case Western Reserve University, Cleveland, OH, 44106, USA  
SOURCE: Journal of Bacteriology (2001), 183(18), 5385-5394  
CODEN: JOBAAY; ISSN: 0021-9193  
PUBLISHER: American Society for Microbiology  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Biofilms are a protected niche for microorganisms, where they are safe from antibiotic treatment and can create a source of persistent infection. Using 2 clin. relevant *C. albicans* biofilm models formed on bioprosthetic materials, it was demonstrated that biofilm formation proceeds through 3 distinct developmental phases. These growth phases transform adherent blastospores to well-defined cellular communities encased in a polysaccharide matrix. Fluorescence and confocal scanning laser microscopy revealed that *C. albicans* biofilms have a highly heterogeneous architecture composed of cellular and noncellular elements. In both models, antifungal resistance of biofilm-grown cells increased in conjunction with biofilm formation. The expression of **agglutinin-like (ALS)** genes, which encode a family of proteins implicated in adhesion to host surfaces, was differentially regulated between planktonic and biofilm-grown cells. The ability of *C. albicans* to form biofilms contrasts sharply with that of *Saccharomyces cerevisiae*, which adhered to bioprosthetic surfaces but failed to form a mature biofilm. The studies described here form the basis for investigations into the mol. mechanisms of *Candida* biofilm biol. and antifungal resistance and provide the means to design novel therapies for biofilm-based infections.  
REFERENCE COUNT: 49 THERE ARE 49 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 6 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2001:353558 HCPLUS  
DOCUMENT NUMBER: 136:96938  
TITLE: Characterization of **agglutinin-like** sequence genes from non-*albicans Candida* and phylogenetic analysis of the **ALS** family  
AUTHOR(S): Hoyer, Lois L.; Fundyga, Ruth; Hecht, Jennifer E.; Kapteyn, Johan C.; Klis, Frans M.; Arnold, Jonathan  
CORPORATE SOURCE: Department of Veterinary Pathobiology, University of Illinois, Urbana, IL, 61802, USA  
SOURCE: Genetics (2001), 157(4), 1555-1567  
CODEN: GENTAE; ISSN: 0016-6731  
PUBLISHER: Genetics Society of America  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB The **ALS** (**agglutinin-like** sequence) gene family of *Candida albicans* encodes cell-surface glycoproteins implicated in adhesion of the organism to host surfaces. As Southern blot anal. with ALS-specific probes suggested the presence of ALS gene families in *C. dubliniensis* and

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C. *tropicalis*; three partial ALS genes were isolated and sequenced from each organism. Northern blot anal. demonstrated that mechanisms governing expression of ALS genes in C. *albicans* and C. *dubliniensis* are different. Western blots with an anti-Als serum showed that cross-reactive proteins are linked by .beta.1,6-glucan in the cell wall of each non-albicans *Candida*, suggesting similar cell wall architecture and conserved processing of Als proteins in these organisms. Although an ALS family is present in each organism, phylogenetic anal. of the C. *albicans*, C. *dubliniensis*, and C. *tropicalis* ALS genes indicated that, within each species, sequence diversification is extensive and unique ALS sequences have arisen. Phylogenetic anal. of the ALS and SAP (secreted aspartyl proteininase) families show that the ALS family is younger than the SAP family. ALS genes in C. *albicans*, C. *dubliniensis*, and C. *tropicalis* tend to be located on chromosomes that also encode genes from the SAP family, yet the two families have unexpectedly different evolutionary histories. Homologous recombination between the tandem repeat sequences present in ALS genes could explain the different histories for co-localized genes in a predominantly clonal organism like C. *albicans*.

REFERENCE COUNT: 52 THERE ARE 52 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 7 OF 23 HCAPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2001:77710 HCAPLUS  
DOCUMENT NUMBER: 134:322199  
TITLE: The ALS5 gene of *Candida albicans* and analysis of the Als5p N-terminal domain  
AUTHOR(S): Hoyer, L. L.; Hecht, J. E.  
CORPORATE SOURCE: Department of Veterinary Pathobiology,  
University of Illinois, Urbana, IL, 61802, USA  
SOURCE: Yeast (2001), 18(1), 49-60  
CODEN: YESTE3; ISSN: 0749-503X  
PUBLISHER: John Wiley & Sons Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB ALS genes of *Candida albicans* encode a family of cell-surface glycoproteins with a three domain structure. Each Als protein has a relatively conserved N-terminal domain, a central domain consisting of a tandemly repeated motif, and a serine-threonine-rich C-terminal domain that is relatively variable across the family. The ALS family exhibits several types of variability that indicate the importance of considering strain and allelic differences when studying ALS genes and their encoded proteins. Anal. of ALS5 provided addnl. evidence of variability within the ALS family. Comparison of the ALS5 sequence from two strains indicated sequence differences larger than strain or allelic mismatches obsd. for other C. *albicans* genes. Screening a collection of commonly used C. *albicans* strains and clin. isolates indicated that ALS5 is not present in several of these strains, supporting the conclusion that the Als protein profile is variable among C. *albicans* isolates. Phys. mapping of ALS5 showed that it is located close to ALS1 on chromosome 6. The N-terminal domain of Als5p was produced in *Pichia pastoris* to initiate structural anal. of this portion of the protein. The

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hydrophobic character of this portion of the protein was exploited in the purifn. scheme. CD anal. of the purified, authenticated protein yielded a high content of antiparallel .beta.-sheet and little to no .alpha.-helical structure. These results are consistent with the conclusion that the N-terminal domain of Als5p has an Ig fold structure similar to that found in many cell adhesion mols. Gene sequences of *C. albicans* ALS5 (Accession No. AF068866) and TPI1 (Accession No. AF124845) have been deposited in the GenBank database.

REFERENCE COUNT: 48 THERE ARE 48 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 8 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2001:3718 HCPLUS  
DOCUMENT NUMBER: 135:222067  
TITLE: Cloning and functional analysis of ALS family genes from *Candida albicans*  
AUTHOR(S): Chen, Xi; Chen, Jiang-Ye  
CORPORATE SOURCE: State Key Laboratory of Molecular Biology, Shanghai Institute of Biochemistry, the Chinese Academy of Sciences, Shanghai, 200031, Peop. Rep. China  
SOURCE: Shengwu Huaxue Yu Shengwu Wuli Xuebao (2000), 32(6), 586-594  
CODEN: SHWPAU; ISSN: 0582-9879  
PUBLISHER: Shanghai Kexue Jishu Chubanshe  
DOCUMENT TYPE: Journal  
LANGUAGE: Chinese  
AB With a 0.5 kb probe of gene CX2 (encoding cytochrome P 450 L1A1 (Lanosterol 14.alpha.-demethylase)), distribution of CX2 tandem repeats was studied in different *C. albicans* strains. Results suggest that all the *C. albicans* strains tested contained the tandem repeat. In order to verify if the expression of CX2 was hyphal specific, its expression was analyzed under various inductive and non-inductive conditions. With CX2 0.5 kb probe, Northern hybridization anal. confirmed that it was specifically in hyphae. The result of chromosomal localization and genomic Southern blot anal. suggested that there were other genes contg. the tandem repeat besides of ALS1 (agglutinin-like sequence). A *C. albicans*'s genomic DNA library was screened with the CX2 0.5 kb probe and several pos. recombinant X phages were obtained. After endonuclease identification, subcloning, and sequence anal., several ALS family genes were cloned. No. 1 X phage DNA contained ALS4, No. 4 X phage DNA contained ALS1, No. 6 X phage DNA contained ALS3. To study the role of ALS family genes in yeast-hyphal transition, als1/ALS1 mutant was constructed by homologous recombination. The ability to form hyphae was tested in different inductive culturing conditions. Defective hyphal growth were obsd. in some solid media.

L2 ANSWER 9 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2000:736647 HCPLUS  
DOCUMENT NUMBER: 135:71860  
TITLE: Cloning and identification of genes related with morphogenesis of *Candida albicans*

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AUTHOR(S): Chen, Xi; Wang, Qin; Chen, Jiang-Ye  
CORPORATE SOURCE: State Key Laboratory of Molecular Biology,  
Shanghai Institute of Biochemistry, The Chinese  
Academy of Sciences, Shanghai, 200031, Peop.

Rep. China  
SOURCE: Shengwu Huaxue Yu Shengwu Wuli Xuebao (2000),  
32(5), 509-515

CODEN: SHWPAU; ISSN: 0582-9879

PUBLISHER: Shanghai Kexue Jishu Chubanshe

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

AB A *Candida albicans* cDNA library was constructed and screened by differential hybridization. In hybridization using probes derived from population of yeast cells or hyphae, 67 recombinant phages exhibited more intense signal with the probe derived from hyphae than with the probe from yeast cells. One phage behaved vice versa. Phys. map anal. and nucleotide sequence anal. suggested that cDNA of the CX1, a clone specific for yeast form, is coding for cytochrome P 450 L1A1 (Lanosterol 14.alpha.-demethylase). Its specific expression pattern was confirmed by Northern anal. Inhibition of serum on the expression of CX1 cDNA was obsd. CX2 cDNA was one of those giving intensive signal with hyphae probes. The cDNA sequence contained a tandem repeat sequence, which was also found in ALS1, another *Candida albicans* gene identified, whose expression was related with morphogenesis. Northern anal. proved that it was expressed intensively with hyphae probes, however the expression could not be detected in those strongly hybridized to yeast cell probes. The locations of both cDNA on chromosome were analyzed.

L2 ANSWER 10 OF 23 HCPLUS COPYRIGHT 2002 ACS

ACCESSION NUMBER: 2000:710707 HCPLUS

DOCUMENT NUMBER: 133:330262

TITLE: Identification and characterization of genes for protein-mannosyltransferases (CaPMT1, CaPMT6) of the human pathogen fungus *Candida albicans*

AUTHOR(S): Timpel, Claudia

CORPORATE SOURCE: Dusseldorf, Germany

SOURCE: Fortschritt-Berichte VDI, Reihe 17: Biotechnik (1998), 180, i-ix, 1-108

CODEN: FBRBFL; ISSN: 0178-9600

PUBLISHER: VDI Verlag GmbH

DOCUMENT TYPE: Journal

LANGUAGE: German

AB The protein mannosyltransferase genes CaPMT1 and CAPMT6 were identified in pathogenic *Candida albicans*. Mutants with disruptions in both CaPMT1 alleles showed decreased growth, cell aggregate formation, defective hyphae formation, increased sensitivity towards antimycotics (e.g. hygromycin B, G418, clotrimazol), and decreased adhesion on epithelial cells. They were avirulent in a mouse model of systemic infections. Several cell surface proteins (e.g. chitinase, Als 1 protein) were modified. Heterozygotously disrupted *C. albicans* strains and pmt6 mutants were defective in hyphae formation, had an increased sensitivity towards hygromycin B, and a decreased virulence.

REFERENCE COUNT: 196 THERE ARE 196 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE

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L2 ANSWER 11 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2000:525150 HCPLUS  
DOCUMENT NUMBER: 134:1195  
TITLE: The ALS6 and ALS7 genes of *Candida albicans*  
AUTHOR(S): Hoyer, L. L.; Hecht, J. E.  
CORPORATE SOURCE: Department of Veterinary Pathobiology, University of Illinois, Urbana, IL, 61802, USA  
SOURCE: Yeast (2000), 16(9), 847-855  
CODEN: YESTE3; ISSN: 0749-503X  
PUBLISHER: John Wiley & Sons Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB ALS genes of *Candida albicans* encode a family of cell-surface glycoproteins that are composed of an N-terminal domain, a central domain of a tandemly repeated motif, and a relatively variable C-terminal domain. Although several ALS genes have been characterized, more ALS-like sequences are present in the *C. albicans* genome. Two short DNA sequences with similarity to the 5' domains of known ALS genes were detected among data from the *C. albicans* genome sequencing project. Probes developed from unique regions of these sequences were used to screen a genomic library from which two full-length genes, designated ALS6 and ALS7, were cloned. ALS6 and ALS7 encode features similar to other genes in the ALS family and map to chromosome 3, a chromosome previously not known to encode ALS sequences. ALS6 and ALS7 are present in all *C. albicans* strains examd. Addnl. anal. suggested that some *C. albicans* strains have another ALS gene with a 5' domain similar to that of ALS6. Characterization of ALS7 revealed a novel tandemly repeated sequence within the C-terminal domain. Unlike other ALS family tandem repeats, the newly characterized ALS7 repeat does not appear to define addnl. genes in the ALS family. However, these data and information from the *C. albicans* genome sequencing project suggest that there are addnl. ALS genes remaining to be characterized. Gene sequences of ALS6 (Accession No. AF075293) and ALS7 (Accession Nos. AF075294 and AF201684) were deposited in the GenBank database.

REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 12 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2000:376242 HCPLUS  
DOCUMENT NUMBER: 134:144364  
TITLE: TUP1, CPH1 and EFG1 make independent contributions to filamentation in *Candida albicans*  
AUTHOR(S): Braun, Burkhard R.; Johnson, Alexander D.  
CORPORATE SOURCE: Department of Microbiology, University of California, San Francisco, CA, 94143-0414, USA  
SOURCE: Genetics (2000), 155(1), 57-67  
CODEN: GENTAE; ISSN: 0016-6731  
PUBLISHER: Genetics Society of America  
DOCUMENT TYPE: Journal  
LANGUAGE: English

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AB The common fungal pathogen, *Candida albicans*, can grow either as single cells or as filaments (hyphae), depending on environmental conditions. Several transcriptional regulators have been identified as having key roles in controlling filamentous growth, including the products of the TUP1, CPH1, and EFG1 genes. We show, through a set of single, double, and triple mutants, that these genes act in an additive fashion to control filamentous growth, suggesting that each gene represents a sep. pathway of control. We also show that environmentally induced filamentous growth can occur even in the absence of all three of these genes, providing evidence for a fourth regulatory pathway. Expression of a collection of structural genes assocd. with filamentous growth, including HYR1, ECE1, HWP1, **ALS1**, and CHS2, was monitored in strains lacking each combination of TUP1, EFG1, and CPH1. Different patterns of expression were obsd. among these target genes, supporting the hypothesis that these three regulatory proteins engage in a network of individual connections to downstream genes and arguing against a model whereby the target genes are regulated through a central filamentous growth pathway. The results suggest the existence of several distinct types of filamentous forms of *C. albicans*, each dependent on a particular set of environmental conditions and each expressing a unique set of surface proteins.

REFERENCE COUNT: 55 THERE ARE 55 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 13 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 2000:129195 HCPLUS  
DOCUMENT NUMBER: 132:248349  
TITLE: The cell wall architecture of *Candida albicans* wild-type cells and cell wall-defective mutants  
AUTHOR(S): Kapteyn, J. C.; Hoyer, L. L.; Hecht, J. E.; Muller, W. H.; Andel, A.; Verkleij, A. J.; Makarow, M.; Van Den Ende, H.; Klis, F. M.  
CORPORATE SOURCE: Swammerdam Institute of Life Sciences, University of Amsterdam, Amsterdam, 1098 SM, Neth.  
SOURCE: Molecular Microbiology (2000), 35(3), 601-611  
CODEN: MOMIEE; ISSN: 0950-382X  
PUBLISHER: Blackwell Science Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB In *Candida albicans* wild-type cells, the .beta.1,6-glucanase-extractable glycosylphosphatidylinositol (GPI)-dependent cell wall proteins (CWP) account for about 88% of all covalently linked CWP. Approx. 90% of these GPI-CWP, including Als1p and Als3p, are attached via .beta.1,6-glucan to .beta.1,3-glucan. The remaining GPI-CWP are linked through .beta.1,6-glucan to chitin. The .beta.1,6-glucanase-resistant protein fraction is small and consists of Pir-related CWP, which are attached to .beta.1,3-glucan through an alkalilabile linkage. Immunogold labeling and Western anal., using an antiserum directed against *Saccharomyces cerevisiae* Pir2p/Hsp150, point to the localization of at least two differentially expressed Pir2 homologues in the cell wall of *C. albicans*. In mnn9.DELTA. and pmt1.DELTA. mutant strains, which are defective in

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N- and O-glycosylation of proteins resp., we obsd. enhanced chitin levels together with an increased coupling of GPI-CWPs through .beta.1,6-glucan to chitin. In these cells, the level of Pir-CWPs was slightly upregulated. A slightly increased incorporation of Pir proteins was also obsd. in a .beta.1,6-glucan-deficient hemizygous kre6.DELTA. mutant. Taken together, these observations show that *C. albicans* follows the same basic rules as *S. cerevisiae* in constructing a cell wall and indicate that a cell wall salvage mechanism is activated when *Candida* cells are confronted with cell wall weakening.

REFERENCE COUNT: 52 THERE ARE 52 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 14 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 1999:578611 HCPLUS  
DOCUMENT NUMBER: 131:283671  
TITLE: Adhesins in *Candida albicans*  
AUTHOR(S): Sundstrom, Paula  
CORPORATE SOURCE: Department of Medical Microbiology and Immunology, Ohio State University Columbus, Columbus, OH, 43210-1239, USA  
SOURCE: Current Opinion in Microbiology (1999), 2(4), 353-357  
CODEN: COMIF7; ISSN: 1369-5274  
PUBLISHER: Current Biology Publications  
DOCUMENT TYPE: Journal; General Review  
LANGUAGE: English  
AB A review with 35 refs. The adherent properties of *Candida albicans* blasloconidia and germ tubes have long been appreciated, but little is known about the mechanisms responsible for adherence. Recently, three genes, ALA1, ALS1 and HWP1, encoding proteins with adherent properties and motifs consistent with linkage to the .beta.-1,6-glucan of *C. albicans* cell walls have provided insight into the topol. of protein adhesins. Hwp1, a developmentally regulated adhesin of germ tubes and hyphae, attaches to buccal epithelial cells by an unconventional, transglutaminase-mediated mechanism of adhesion.  
REFERENCE COUNT: 35 THERE ARE 35 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 15 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 1998:729949 HCPLUS  
DOCUMENT NUMBER: 130:137543  
TITLE: Up-regulation of two *Candida albicans* genes in the rat model of oral candidiasis detected by differential display  
AUTHOR(S): Zhao, Xiao-Jiong; Newsome, Joseph T.; Cihlar, Ronald L.  
CORPORATE SOURCE: Department of Microbiology and Immunology, Georgetown University, Washington, DC, 20007, USA  
SOURCE: Microbial Pathogenesis (1998), 25(3), 121-129  
CODEN: MIPAEV; ISSN: 0882-4010  
PUBLISHER: Academic Press  
DOCUMENT TYPE: Journal  
LANGUAGE: English

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AB **Candida albicans** is an opportunistic fungal pathogen responsible for the largest percentage of fungal-mediated oral and esophageal disease. In this regard, knowledge concerning patterns of gene expression during the establishment and/or maintenance of infection may be the key to the design of new strategies for treatment, as well as providing insight into pathogenesis. To address this issue, expts. were performed that utilized differential display to compare the spectrum of **C. albicans** genes expressed during oral infection vs. growth in vitro culture. Exptl., the rat model of oral candidiasis served as the in vivo source. After initiation of infection and subsequent harvesting of **C. albicans** from the rat oral cavity, RNA was isolated, and used with a small no. of primers in reverse-transcriptase polymerase chain reaction (RT-PCR) and differential display expts. Fragments unique to in vivo samples were subcloned and sequenced. Southern blot anal. verified the origin of seven fragments as from **C. albicans**. Addnl., specific RT-PCR confirmed that two of these fragments represented genes that were up-regulated during **C. albicans** in vivo growth in the rat model. Database searches indicated the fragments share homol. with a member of the **C. albicans** agglutinin gene family and to a bacterial gene (gidB) possibly involved in cell division. (c) 1998 Academic Press.

REFERENCE COUNT: 32 THERE ARE 32 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 16 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 1998:681160 HCPLUS  
DOCUMENT NUMBER: 130:22640  
TITLE: Identification of **Candida albicans** ALS2 and ALS4 and localization of Als proteins to the fungal cell surface  
AUTHOR(S): Hoyer, L. L.; Payne, T. L.; Hecht, J. E.  
CORPORATE SOURCE: Department of Veterinary Pathobiology,  
University of Illinois, Urbana, IL, 61802, USA  
SOURCE: Journal of Bacteriology (1998), 180(20),  
5334-5343  
CODEN: JOBAAY; ISSN: 0021-9193

PUBLISHER: American Society for Microbiology  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Addnl. genes in the growing ALS (agglutinin-like sequence) family of **Candida albicans** were isolated by PCR screening of a genomic fosmid library with primers designed from the consensus tandem-repeat sequence of **ALS1**. This procedure yielded fosmids encoding ALS2 and ALS4. ALS2 and ALS4 conformed to the three-domain structure of ALS genes, which consists of a central domain of tandemly repeated copies of a 108-bp motif, an upstream domain of highly conserved sequences, and a domain of divergent sequences 3' of the tandem repeats. Alignment of five predicted Als protein sequences indicated conservation of N- and C-terminal hydrophobic regions which have the hallmarks of secretory signal sequences and glycosylphosphatidylinositol addn. sites, resp. Heterologous expression of an N-terminal fragment of **Als1p** in *Saccharomyces cerevisiae* demonstrated function of the putative signal sequence with cleavage following Ala17. This signal sequence

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cleavage site was conserved in the four other Als proteins analyzed, suggesting identical processing of each protein. Primary-structure features of the five Als proteins suggested a cell-surface localization, which was confirmed by indirect immunofluorescence with an anti-Als antiserum. Staining was obsd. on mother yeasts and germ tubes, although the intensity of staining on the mother yeast decreased with elongation of the germ tube. Similar to other ALS genes, ALS2 and ALS4 were differentially regulated. ALS4 expression was correlated with the growth phase of the culture; ALS2 expression was not obsd. under many different in vitro growth conditions. The data presented here demonstrate that ALS genes encode cell-surface proteins and support the conclusion that the size and no. of Als proteins on the *C. albicans* cell surface vary with strain and growth conditions.

REFERENCE COUNT: 57 THERE ARE 57 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L2 ANSWER 17 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 1998:557795 HCPLUS  
DOCUMENT NUMBER: 129:257448  
TITLE: Multiple functions of Pmtlp-mediated protein O-mannosylation in the fungal pathogen *Candida albicans*  
AUTHOR(S): Timpel, Claudia; Strahl-Bolsingers, Sabine;  
Ziegelbauer, Karl; Ernst, Joachim F.  
CORPORATE SOURCE: Institut fur Mikrobiologie und Biologisch-Medizinisches Forschungszentrum,  
Heinrich-Heine-Universitat, Dusseldorf, D-40225,  
Germany  
SOURCE: Journal of Biological Chemistry (1998), 273(33),  
20837-20846  
CODEN: JBCHA3; ISSN: 0021-9258  
PUBLISHER: American Society for Biochemistry and Molecular Biology  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Protein mannosylation by Pmt proteins initiates O-glycosylation in fungi. We have identified the PMT1 gene and analyzed the function of Pmtlp in the fungal human pathogen *Candida albicans*. Mutants defective in PMT1 alleles lacked Pmt in vitro enzymic activity, showed reduced growth rates, and tended to form cellular aggregates. In addn., multiple specific deficiencies not known in *Saccharomyces cerevisiae* (including defective hyphal morphogenesis; supersensitivity to the antifungal agents hygromycin B, G418, clotrimazole, and calcofluor white; and reduced adherence to Caco-2 epithelial cells) were obsd. in pmt1 mutants. PMT1 deficiency also led to faster electrophoretic mobility of the Als1p cell wall protein and to elevated extracellular activities of chitinase. Homozygous pmt1 mutants were avirulent in a mouse model of systemic infection, while heterozygous PMT1/pmt1 strains showed reduced virulence. The results indicate that protein O-mannosylation by Pmt proteins occurs in different fungal species, where PMT1 deficiency can lead to defects in multiple cellular functions.

L2 ANSWER 18 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 1998:399926 HCPLUS

Searcher : Shears 308-4994

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DOCUMENT NUMBER: 129:326716  
TITLE: *Candida albicans* ALS3 and insights into the nature of the ALS gene family  
AUTHOR(S): Hoyer, L. L.; Payne, Tracie L.; Bell, M.; Myers, Alan M.; Scherer, S.  
CORPORATE SOURCE: 2522 VMBSB, Department of Veterinary Pathobiology, University of Illinois at Urbana-Champaign, 2001 S. Lincoln Avenue, Urbana, IL, 61802, USA  
SOURCE: Current Genetics (1998), 33(6), 451-459  
CODEN: CUGED5; ISSN: 0172-8083  
PUBLISHER: Springer-Verlag  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB The **ALS1** (agglutinin-like sequence) gene of *Candida albicans* encodes a protein similar to alpha-agglutinin, a cell-surface adhesion glycoprotein of *Saccharomyces cerevisiae* (Hoyer et al. 1995). A central domain of a tandemly repeated 108-bp sequence is found in the **ALS1** coding region. This tandem-repeat motif hybridizes to multiple *C. albicans* genomic DNA fragments, indicating the possibility of other **ALS1**-like genes in *C. albicans* (Hoyer et al. 1995). To det. if these fragments constitute a gene family, tandem-repeat-hybridizing genomic fragments were isolated from a fosmid library by PCR screening using primers based on the consensus tandem-repeat sequence of **ALS1** (Hoyer et al. 1995). One group of fosmids, designated ALS3, encodes a gene with 81% identity to **ALS1**. The sequences of **ALS1** and ALS3 are most conserved in the tandem-repeat domain and in the region 5' of the tandem repeats. Northern-blot anal. using unique probes from the 3' end of each gene demonstrated that **ALS1** expression varies, depending on which *C. albicans* strain is examd., and that ALS3 is hyphal-specific. Both genes are found in a variety of *C. albicans* and *C. stellatoidea* strains exmd. The predicted Als1p and Als3p exhibit features suggesting that both are cell-surface glycoproteins. Southern blots probed with conserved sequences from the region 5' of the tandem repeats suggest that other ALS-like sequences are present in the *C. albicans* genome and that the ALS family may be larger than originally estd.

L2 ANSWER 19 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 1998:214170 HCPLUS  
DOCUMENT NUMBER: 128:320030  
TITLE: Expression of the *Candida albicans* gene **ALS1** in *Saccharomyces cerevisiae* induces adherence to endothelial and epithelial cells  
AUTHOR(S): Fu, Yue; Rieg, Gunter; Fonzi, William A.; Belanger, Paul H.; Edwards, John E., Jr.; Filler, Scott G.  
CORPORATE SOURCE: St. John's Cardiovascular Research Center, Division of Infectious Diseases, Department of Medicine, Harbor-UCLA Research and Education Institute, Torrance, CA, 90502, USA  
SOURCE: Infection and Immunity (1998), 66(4), 1783-1786  
CODEN: INFIBR; ISSN: 0019-9567  
PUBLISHER: American Society for Microbiology  
DOCUMENT TYPE: Journal

09/715876

LANGUAGE: English  
AB To identify genes encoding adhesins that mediate the binding of *Candida albicans* to endothelial cells, a genomic library from this organism was constructed and used to transform *Saccharomyces cerevisiae*. These transformed organisms were screened for adherence to endothelial cells, and a highly adherent clone was identified. The adherence of this clone to endothelial cells was over 100-fold greater than that of control *S. cerevisiae* transformed with the empty plasmid. This clone also exhibited enhanced adherence to epithelial cells. The *C. albicans* gene contained within this clone was **ALS1**. These results indicate that **ALS1** may encode a candidal adhesin.

L2 ANSWER 20 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 1997:773548 HCPLUS  
DOCUMENT NUMBER: 128:98314  
TITLE: Expression, cloning, and characterization of a *Candida albicans* gene, ALA1, that confers adherence properties upon *Saccharomyces cerevisiae* for extracellular matrix proteins  
AUTHOR(S): Gaur, Nand K.; Klotz, Stephen A.  
CORPORATE SOURCE: Research Service, Veterans Affairs Medical Center, Kansas City, MO, USA  
SOURCE: Infection and Immunity (1997), 65(12), 5289-5294  
CODEN: INFIBR; ISSN: 0019-9567  
PUBLISHER: American Society for Microbiology  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Adherence of *Candida albicans* to host tissues is a necessary step for maintenance of its commensal status and is likely a necessary step in the pathogenesis of candidiasis. The extracellular matrix (ECM) proteins are some of the host tissue and plasma proteins to which *C. albicans* adheres through adhesins located on the fungal cell surface. To isolate genes encoding ECM adhesins, an assay was developed based on the ability of yeast cells to adhere to magnetic beads coated with the ECM protein fibronectin, type IV collagen, or laminin. A *C. albicans* genomic library was constructed by cloning XbaI-partially-digested and size-selected fragments into pAUR112, an Escherichia coli-yeast low-copy-no. shuttle vector. The *C. albicans* library was transformed into *Saccharomyces cerevisiae* YPH 499, and clones capable of adherence were selected by using ECM protein-coated magnetic beads. A plasmid contg. an apprx.-8-kb insert was isolated from 29 adherent clones. These clones exhibited adherence to all ECM protein-coated magnetic beads and to human buccal epithelial cells. The ALA1 gene (for agglutinin-like adhesin) was localized by subcloning it into a 5-kb XbaI fragment which retained the adherence phenotype in both orientations. The complete DNA sequence of the 5-kb insert was detd., and an open reading frame (ORF) encoding 1,419 amino acid residues was identified. Deletions from the 5' and 3' ends extending into the DNA sequence encoding the 1,419-amino-acid ORF product inactivated the adherence phenotype, suggesting that it is the coding region of the ALA1 gene. A database search identified ALA1 to be similar to the *C. albicans* **ALS1** (for agglutinin-like sequence 1) protein and the *S. cerevisiae* agglutinin

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protein (AG.alpha.1), although the homol. at the primary amino acid sequence level is limited to the first half of each of these proteins. ALA1 contains a central domain of six tandem repeats of 36 amino acids. We discuss the significance of various predicted ALA1 structural motifs and their relationships to function in the adherence process.

L2 ANSWER 21 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 1996:473241 HCPLUS  
DOCUMENT NUMBER: 125:134790  
TITLE: *Candida albicans* and C.  
stellatoidea gene **ALS1** PCR primers and  
probes for infection diagnosis  
INVENTOR(S): Hoyer, Lois L.; Livi, George P.; Shatzman, Allan  
PATENT ASSIGNEE(S): Smithkline Beecham Corporation, USA  
SOURCE: PCT Int. Appl., 32 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9618745	A1	19960620	WO 1995-US16153	19951208
W: AM, AU, BB, BG, BR, BY, CA, CN, CZ, EE, FI, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LT, LV, MD, MG, MN, MX, NO, NZ, PL, PT, RO, RU, SD, SG, SI, SK, TJ, TT, UA, US, UZ, VN RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
US 5668263	A	19970916	US 1994-357962	19941216
CA 2207816	AA	19960620	CA 1995-2207816	19951208
AU 9644686	A1	19960703	AU 1996-44686	19951208
EP 820523	A1	19980128	EP 1995-943412	19951208
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI				
ZA 9501645	A	19960904	ZA 1995-10645	19951214
US 5817466	A	19981006	US 1997-878106	19970618
PRIORITY APPLN. INFO.:			US 1994-357962	19941216
			WO 1995-US16153	19951208

AB This invention relates to nucleic acid sequences conserved in strains of yeasts. More particularly, this invention relates to segments of the **ALS1** gene of *Candida albicans* useful as probes and primers for the identification of yeast, particularly *Candida*, infections.

L2 ANSWER 22 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 1995:301691 HCPLUS  
DOCUMENT NUMBER: 122:179968  
TITLE: *Candida albicans*  
**ALS1**: domains related to a *Saccharomyces cerevisiae* sexual agglutinin separated by a repeating motif  
AUTHOR(S): Hoyer, L. L.; Scherer, S.; Shatzman, A. R.;  
Livi, G. P.  
CORPORATE SOURCE: Human Genome Cent., Lawrence Berkeley Lab.,  
Berkeley, CA, 94720, USA  
SOURCE: Molecular Microbiology (1995), 15(1), 39-54

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CODEN: MOMIEE; ISSN: 0950-382X

PUBLISHER: Blackwell  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Transfer of budding *Candida albicans* yeast cells from the rich, complex medium YEPD to the defined tissue culture medium RPMI 1640 (RPMI) at 37.degree. and 5% CO<sub>2</sub> causes rapid onset of hyphal induction. Among the genes induced under these conditions are hyphal-specific genes as well as genes expressed in response to changes in temp., CO<sub>2</sub>, and specific media components. A cDNA library constructed from cells incubated for 20 min in RPMI was differentially screened with yeast (YEPD)- and hyphal (RPMI)-specific probes resulting in identification of a gene expressed in response to culture conditions but not regulated by the yeast-hyphal transition. The deduced gene product displays significant identity to *Saccharomyces cerevisiae* .alpha.-agglutinin, encoded by AG.alpha.1, an adhesion glycoprotein that mediates mating of haploid cells. The presence of this gene in *C. albicans* is curious since the organism has not been obsd. to undergo meiosis. The *C. albicans* gene was designated **ALS1** (for agglutinin-like sequence). Although the N- and C-termini of the predicted 1260-amino-acid **ALS1** protein resemble those of the 650-amino-acid AG.alpha.1, **ALS1** contains a central domain of tandem repeats consisting of a highly conserved 36-amino-acid sequence not present in AG.alpha.1. These repeats are also present on the nucleotide level as a highly conserved 108-bp motif. Southern and Northern blot analyses indicate a family of *C. albicans* genes that contain the tandem repeat motif; at least one gene in addn. to **ALS1** is expressed under conditions similar to those for **ALS1** expression. Genomic Southern blots from several *C. albicans* isolates indicate that the no. of copies of the tandem repeat element in **ALS1** differs across strains and, in some cases, between **ALS1** alleles in the same strain, suggesting a strain-dependent variability in **ALS1** protein size. Potential roles for the **ALS1** protein are discussed.

L2 ANSWER 23 OF 23 HCPLUS COPYRIGHT 2002 ACS  
ACCESSION NUMBER: 1979:414474 HCPLUS  
DOCUMENT NUMBER: 91:14474  
TITLE: Antibiotics and antiseptic compounds from the family Bonnemaisoniaceae (Florideophyceae)  
AUTHOR(S): Fenical, William; McConnell, Oliver J.; Stone, Anne  
CORPORATE SOURCE: Inst. Mar. Resour., Scripps Inst. Oceanogr., La Jolla, CA, 92093, USA  
SOURCE: Proc. Int. Seaweed Symp. (1979), Volume Date 1977, 9, 387-400  
CODEN: ISSYA4; ISSN: 0074-7874  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Components of Bonnemaisonia asparagoides, *B. nootkana*, *Asparagopsis taxiformis*, and *A. armata* have antibacterial and antifungal activity. These components are active against both *Staphylococcus aureus* and *Candida albicans*, with only slight activity against *Escherichia coli* and *Vibrio anguillarium*. The halobutenones and Et dibromoacrylate [63881-48-1] from *Asparagopsis* showed significantly greater activity against *C. albicans*

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than S. aureus. Almost all of the compds. were at least slightly active against .gtoreq.1 pathogens.

(FILE 'MEDLINE, BIOSIS, EMBASE, WPIDS, JICST-EPLUS, JAPIO,  
TOXCENTER, PHIC, PHIN' ENTERED AT 09:53:19 ON 07 OCT 2002)

L3  
58 S L2

L4  
~~27 DUP REM L3 (31) DUPLICATES REMOVED~~)

L4 ANSWER 1 OF 27 MEDLINE DUPLICATE 1  
ACCESSION NUMBER: 2002426471 MEDLINE  
DOCUMENT NUMBER: 22170774 PubMed ID: 12183577  
TITLE: Contribution of **Candida albicans**  
ALS1 to the pathogenesis of experimental oropharyngeal candidiasis.  
AUTHOR: Kamai Yasuki; Kubota Mikie; Kamai Yoko; Hosokawa Tsunemichi; Fukuoka Takashi; Filler Scott G  
CORPORATE SOURCE: Biological Research Laboratory, Sankyo Co., Ltd., Shinagawa-ku, Tokyo 140-8710, Japan..  
ykamai@shina.sankyo.co.jp  
CONTRACT NUMBER: P01 AI37194 (NIAID)  
R01 AI19990 (NIAID)  
R01 DE13974 (NIDCR)  
SOURCE: INFECTION AND IMMUNITY, (2002 Sep) 70 (9) 5256-8.  
Journal code: 0246127. ISSN: 0019-9567.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
ENTRY MONTH: 200209  
ENTRY DATE: Entered STN: 20020817  
Last Updated on STN: 20020919  
Entered Medline: 20020918  
AB We investigated the contribution of **Candida albicans** ALS1, which encodes a candidal adhesin, to the pathogenesis of experimental murine oropharyngeal candidiasis. Our results indicate that the **ALS1** gene product is important for the adherence of the organism to the oral mucosa during the early stage of the infection.

L4 ANSWER 2 OF 27 EMBASE COPYRIGHT 2002 ELSEVIER SCI. B.V.  
ACCESSION NUMBER: 2002307159 EMBASE  
TITLE: Evaluation of the antimicrobial potential of medicinal plants from the ivory coast.  
AUTHOR: Kamanzi Atindehou K.; Kone M.; Terreaux C.; Traore D.; Hostettmann K.; Dosso M.  
CORPORATE SOURCE: K. Hostettmann, Inst. of Pharmacognosy/Phytochem., BEP, University of Lausanne, CH-1015 Lausanne, Switzerland. kurt.hostettmann@ipp.unil.ch  
SOURCE: Phytotherapy Research, (2002) 16/5 (497-502).  
Refs: 19  
ISSN: 0951-418X CODEN: PHYREH  
COUNTRY: United Kingdom  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 004 Microbiology  
030 Pharmacology  
037 Drug Literature Index  
LANGUAGE: English  
SUMMARY LANGUAGE: English

09/715876

AB A total of 148 crude ethanol extracts from 115 plant species were tested in vitro against Gram-negative strains (*Escherichia coli*, *Pseudomonas aeruginosa*) and the Gram-positive *Staphylococcus aureus* and *Enterococcus faecalis*. Moreover, they were submitted to antifungal assays against *Candida albicans* and *Cladosporium cucumerinum*, a human and a plant pathogenic microorganism, respectively, known to be good indicators of antifungal activity. No activity was detected against the Gram-negative bacteria, while 14.8% and 10.8% of the extracts showed Gram-positive bactericidal or bacteriostatic effects on *S. aureus* and *E. faecalis*, respectively. An antifungal activity was observed with 15 extracts (10.1%). Two species were particularly active against the fungi: *Dioscorea minutiflora* and *Erythrina vogelii*. The young tubers of *D. minutiflora* contain metabolites with a specific effect on fungi and were not active against the bacteria. On the other hand, *E. vogelii* was highly effective against the Gram-positive bacteria and the fungi. Copyright .COPYRGT. 2002 John Wiley & Sons, Ltd.

L4 ANSWER 3 OF 27	MEDLINE	DUPLICATE 2
ACCESSION NUMBER:	2002419655 IN-PROCESS	
DOCUMENT NUMBER:	22164023 PubMed ID: 12174081	
TITLE:	Adhesion in <i>Candida</i> spp.	
AUTHOR:	Sundstrom Paula	
CORPORATE SOURCE:	Department of Molecular Virology, Immunology and Medical Genetics, and the Department of Microbiology, The Ohio State University College of Medicine, Columbus, OH 43210-1239, USA.	
SOURCE:	CELLULAR MICROBIOLOGY, (2002 Aug) 4 (8) 461-9. Journal code: 100883691. ISSN: 1462-5814.	
PUB. COUNTRY:	England: United Kingdom	
DOCUMENT TYPE:	Journal; Article; (JOURNAL ARTICLE)	
LANGUAGE:	English	
FILE SEGMENT:	IN-PROCESS; NONINDEXED; Priority Journals	
ENTRY DATE:	Entered STN: 20020814 Last Updated on STN: 20020814	

AB Microbial adherence is one of the most important determinants of pathogenesis, yet very few adhesins have been identified from fungal pathogens. Four structurally related adhesins, *Hwp1*, *Ala1p/Als5p*, *Als1p*, from *Candida albicans* and *Ep1p* from *Candida glabrata*, are members of a class of proteins termed glycosylphosphatidylinositol-dependent cell wall proteins (GPI-CWP). These proteins have N-terminal signal peptides and C-terminal features that mediate glycosylphosphatidylinositol (GPI) membrane anchor addition, as well as other determinants leading to attachment to cell wall glucan. While common signalP/GPI motifs facilitate cell surface expression, unique features mediate ligand binding specificities of adhesins. The first glimpse of structural features of putative adhesins has come from biophysical characterizations of the N-terminal domain of *Als5p*. One protein not in the GPI-CWP class that was initially described as an adhesin, *Int1p*, has recently been shown to be similar to *Bud4p* of *Saccharomyces cerevisiae* in primary amino acid sequence, in co-localizing with septins and in functioning in bud site selection. Progress in understanding the role of adhesins in oesophageal candidiasis has been made for *Hwp1* in a study using beige athymic and transgenic *varepsilon 26* mice that have combined defects in innate and acquired immune responses. Searches of the C.

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**albicans** genome for proteins in the GPI-CWP class has led to the identification of a subset of genes that will be the focus of future efforts to identify new **Candida** adhesins.

L4 ANSWER 4 OF 27 EMBASE COPYRIGHT 2002 ELSEVIER SCI. B.V.  
ACCESSION NUMBER: 2002317805 EMBASE  
TITLE: Evaluation of *Evolvulus alsinoides* Linn.  
for anthelmintic and antimicrobial activities.  
AUTHOR: Dash G.K.; Suresh P.; Sahu S.K.; Kar D.M.; Ganapaty S.; Panda S.B.  
CORPORATE SOURCE: G.K. Dash, Institute of Pharmacy and Technology,  
Salipur, Cuttack District, Orissa-754202, India.  
gk\_dash@rediffmail.com  
SOURCE: Journal of Natural Remedies, (2002) 2/2 (182-185).  
Refs: 10  
ISSN: 0972-5547 CODEN: JNROAD  
COUNTRY: India  
DOCUMENT TYPE: Journal; Article  
FILE SEGMENT: 004 Microbiology  
030 Pharmacology  
037 Drug Literature Index  
LANGUAGE: English  
SUMMARY LANGUAGE: English

AB Objective: To study the anthelmintic and antimicrobial activities of the ethanolic extract of *Evolvulus alsinoides* Linn.  
Materials and methods: The anthelmintic activity was evaluated on adult Indian earthworm *Pheretima posthuma* due to its anatomical and physiological resemblance with the intestinal roundworm parasites of human beings. The antibacterial activity of the crude ethanolic extract was performed by agar cup plate method. Results: The ethanolic extract caused paralysis followed by death of the worms at all tested dose levels. It was observed that the ethanolic extract of *Evolvulus alsinoides* is more potent than the reference control piperazine citrate. Potency of the extract was inversely proportional to the time taken for paralysis/ death of the worms. The activity confirms the dose dependency nature of the extract. The results of antimicrobial activity revealed that the extract exhibited activity against *Pseudomonas aeruginosa* and *Escherichia coli* but inactive against *Staphylococcus aureus* and **Candida albicans**. None of test concentrations exhibited comparable activity with the reference control ampicillin trihydrate.  
Conclusion: The present study concludes that the plant is also endowed with potential anthelmintic property in addition to its other popular uses in the traditional system of medicine.

L4 ANSWER 5 OF 27 MEDLINE DUPLICATE 3  
ACCESSION NUMBER: 2002230107 MEDLINE  
DOCUMENT NUMBER: 21964592 PubMed ID: 11967069  
TITLE: **Candida albicans** Als1p:  
an adhesin that is a downstream effector of the EFG1 filamentation pathway.  
AUTHOR: Fu Yue; Ibrahim Ashraf S; Sheppard Donald C; Chen Yee-Chun; French Samuel W; Cutler Jim E; Filler Scott G; Edwards John E Jr  
CORPORATE SOURCE: Division of Infectious Diseases, St John's Cardiovascular Research Center, Harbor-UCLA Research and Education Institute, Bldg. RB2, 1124 West Carson St., Torrance, CA 90502, USA.. Fue\_Yu@humc.edu

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CONTRACT NUMBER: 1S10 RR 13004 (NCRR)  
M01 RR 00425 (NCRR)  
P01 AI 37194 (NIAID)  
R01 AI 19990 (NIAID)  
R29 AI 40636 (NIAID)

SOURCE: MOLECULAR MICROBIOLOGY, (2002 Apr) 44 (1) 61-72.  
Journal code: 8712028. ISSN: 0950-382X.

PUB. COUNTRY: England: United Kingdom  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)

LANGUAGE: English

FILE SEGMENT: Priority Journals

ENTRY MONTH: 200208

ENTRY DATE: Entered STN: 20020423  
Last Updated on STN: 20020817  
Entered Medline: 20020816

AB Filamentation and adherence to host cells are critical virulence factors of *Candida albicans*. Multiple filamentation regulatory pathways have been discovered in *C. albicans* using *Saccharomyces cerevisiae* as a model. In *S. cerevisiae*, these pathways converge on Flol1p, which functions as a downstream effector of filamentation and also mediates cell-cell adherence (flocculation). In *C. albicans*, such effector(s) have not yet been identified. Here, we demonstrate that the cell surface protein Als1p is an effector of filamentation in *C. albicans*. We show that Als1p expression is controlled by the transcription factor Efg1p, which is known to be a key regulator of filamentation in *C. albicans*. Further, disruption of ALS1 inhibited filamentation, and autonomous expression of Als1p restored filamentation in an efg1 homozygous null mutant. Thus, Als1p functions as a downstream effector of the EFG1 filamentation pathway. In addition, we found that Als1p mediates both flocculation and adherence of *C. albicans* to endothelial cells in vitro. As a cell surface glycoprotein that mediates filamentation and adherence, Als1p has both structural and functional similarity to *S. cerevisiae* Flol1p. Consistent with our in vitro results, Als1p was required for both normal filamentation and virulence in the mouse model of haematogenously disseminated candidiasis.

L4 ANSWER 6 OF 27 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.

ACCESSION NUMBER: 2002:486896 BIOSIS  
DOCUMENT NUMBER: PREV200200486896

TITLE: Expression analysis of Agglutinin-Like Sequence 1 of *Candida albicans*.

AUTHOR(S): Ibrahim, A. S. (1); Sheppard, D. C. (1); Fu, Y. (1); Edwards, J. E., Jr. (1)

CORPORATE SOURCE: (1) Harbor-UCLA Research and Education Institute, Torrance, CA USA

SOURCE: International Journal of Infectious Diseases, (June, 2002) Vol. 6, No. Supplement 2, pp. 2S47.  
<http://www.isid.org/publications/ijid.shtml>. print.  
Meeting Info.: 12th International symposium on infections in the immunocompromised host Bergen, Norway June 23-26, 2002 International Immunocompromised Host Society  
. ISSN: 1201-9712.

09/715876

DOCUMENT TYPE: Conference  
LANGUAGE: English

L4 ANSWER 7 OF 27 MEDLINE DUPLICATE 4  
ACCESSION NUMBER: 2001469560 MEDLINE  
DOCUMENT NUMBER: 21405741 PubMed ID: 11514524  
TITLE: Biofilm formation by the fungal pathogen  
*Candida albicans*: development,  
architecture, and drug resistance.  
AUTHOR: Chandra J; Kuhn D M; Mukherjee P K; Hoyer L L;  
McCormick T; Ghannoum M A  
CORPORATE SOURCE: Center for Medical Mycology, University Hospitals of  
Cleveland, and Department of Dermatology, Case  
Western Reserve University, Cleveland, Ohio 44106,  
USA.  
CONTRACT NUMBER: AI-36219 (NIAID)  
AI35097-03 (NIAID)  
AI07024 (NIAID)  
R01-DE13992 (NIDCR)  
SOURCE: JOURNAL OF BACTERIOLOGY, (2001 Sep) 183 (18) 5385-94.  
Journal code: 2985120R. ISSN: 0021-9193.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
ENTRY MONTH: 200109  
ENTRY DATE: Entered STN: 20010830  
Last Updated on STN: 20011001  
Entered Medline: 20010927  
AB Biofilms are a protected niche for microorganisms, where they are  
safe from antibiotic treatment and can create a source of persistent  
infection. Using two clinically relevant *Candida*  
*albicans* biofilm models formed on bioprosthetic materials,  
we demonstrated that biofilm formation proceeds through three  
distinct developmental phases. These growth phases transform  
adherent blastospores to well-defined cellular communities encased  
in a polysaccharide matrix. Fluorescence and confocal scanning laser  
microscopy revealed that *C. albicans* biofilms have a  
highly heterogeneous architecture composed of cellular and  
noncellular elements. In both models, antifungal resistance of  
biofilm-grown cells increased in conjunction with biofilm formation.  
The expression of agglutinin-like (ALS)  
genes, which encode a family of proteins implicated in adhesion to  
host surfaces, was differentially regulated between planktonic and  
biofilm-grown cells. The ability of *C. albicans* to form  
biofilms contrasts sharply with that of *Saccharomyces cerevisiae*,  
which adhered to bioprosthetic surfaces but failed to form a mature  
biofilm. The studies described here form the basis for  
investigations into the molecular mechanisms of *Candida*  
biofilm biology and antifungal resistance and provide the means to  
design novel therapies for biofilm-based infections.

L4 ANSWER 8 OF 27 MEDLINE DUPLICATE 5  
ACCESSION NUMBER: 2001394889 MEDLINE  
DOCUMENT NUMBER: 21186039 PubMed ID: 11290712  
TITLE: Characterization of agglutinin-like  
sequence genes from non-albicans  
*Candida* and phylogenetic analysis of the

09/715876

AUTHOR: **ALS family.**  
Hoyer L L; Fundyga R; Hecht J E; Kapteyn J C; Klis F M; Arnold J

CORPORATE SOURCE: Department of Veterinary Pathobiology, University of Illinois, Urbana, Illinois 61802, USA..  
lhoyer@uiuc.edu

CONTRACT NUMBER: AI39441 (NIAID)  
T32-AI07373 (NIAID)

SOURCE: GENETICS, (2001 Apr) 157 (4) 1555-67.  
Journal code: 0374636. ISSN: 0016-6731.

PUB. COUNTRY: United States

DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)

LANGUAGE: English

FILE SEGMENT: Priority Journals

ENTRY MONTH: 200107

ENTRY DATE: Entered STN: 20010716  
Last Updated on STN: 20010716  
Entered Medline: 20010712

AB The **ALS** (agglutinin-like sequence) gene family of **Candida albicans** encodes cell-surface glycoproteins implicated in adhesion of the organism to host surfaces. Southern blot analysis with **ALS**-specific probes suggested the presence of **ALS** gene families in **C. dubliniensis** and **C. tropicalis**; three partial **ALS** genes were isolated from each organism. Northern blot analysis demonstrated that mechanisms governing expression of **ALS** genes in **C. albicans** and **C. dubliniensis** are different. Western blots with an anti-**Als** serum showed that cross-reactive proteins are linked by beta 1,6-glucan in the cell wall of each non-**albicans** **Candida**, suggesting similar cell wall architecture and conserved processing of **Als** proteins in these organisms. Although an **ALS** family is present in each organism, phylogenetic analysis of the **C. albicans**, **C. dubliniensis**, and **C. tropicalis** **ALS** genes indicated that, within each species, sequence diversification is extensive and unique **ALS** sequences have arisen. Phylogenetic analysis of the **ALS** and SAP (secreted aspartyl proteinase) families show that the **ALS** family is younger than the SAP family. **ALS** genes in **C. albicans**, **C. dubliniensis**, and **C. tropicalis** tend to be located on chromosomes that also encode genes from the SAP family, yet the two families have unexpectedly different evolutionary histories. Homologous recombination between the tandem repeat sequences present in **ALS** genes could explain the different histories for co-localized genes in a predominantly clonal organism like **C. albicans**.

L4 ANSWER 9 OF 27 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.  
ACCESSION NUMBER: 2001:402713 BIOSIS  
DOCUMENT NUMBER: PREV200100402713  
TITLE: The **ALS** gene family of **Candida albicans**.  
AUTHOR(S): Hoyer, Lois L. (1)  
CORPORATE SOURCE: (1) Dept of Veterinary Pathobiology, University of Illinois at Urbana-Champaign, 2001 S. Lincoln Avenue, Urbana, IL, 61802: lhoyer@uiuc.edu USA  
SOURCE: Trends in Microbiology, (April, 2001) Vol. 9, No. 4, pp. 176-180. print.

09/715876

ISSN: 0966-842X.

DOCUMENT TYPE:

Article

LANGUAGE:

English

SUMMARY LANGUAGE:

English

AB The ALS gene family of *Candida albicans* encodes large cell-surface glycoproteins that are implicated in the process of adhesion to host surfaces. ALS genes are also found in other *Candida* species that are isolated from cases of clinical disease. Genes in the ALS family are differentially regulated by physiologically relevant mechanisms. ALS genes exhibit several levels of variability including strain- and allele-specific size differences for the same gene, strain-specific differences in gene regulation, the absence of particular ALS genes in certain isolates, and additional ALS coding regions in others. The differential regulation and genetic variability of the ALS genes results in a diverse cell-surface Als protein profile that is also affected by growth conditions. The ALS genes are one example of a gene family associated with pathogenicity mechanisms in *C. albicans* and other *Candida* species.

L4 ANSWER 10 OF 27

MEDLINE

DUPLICATE 6

ACCESSION NUMBER: 2001126199 MEDLINE

DOCUMENT NUMBER: 21064501 PubMed ID: 11124701

TITLE:

The ALS5 gene of *Candida albicans* and analysis of the Als5p N-terminal domain.

AUTHOR:

Hoyer L L; Hecht J E

CORPORATE SOURCE:

Department of Veterinary Pathobiology, University of Illinois, Urbana, IL 61802, USA.. lhoyer@uiuc.edu

CONTRACT NUMBER:

AI39441 (NIAID)

RR07141 (NCRR)

SOURCE:

YEAST, (2001 Jan 15) 18 (1) 49-60.

Journal code: 8607637. ISSN: 0749-503X.

PUB. COUNTRY:

England: United Kingdom

DOCUMENT TYPE:

Journal; Article; (JOURNAL ARTICLE)

LANGUAGE:

English

FILE SEGMENT:

Priority Journals

OTHER SOURCE:

GENBANK-AF068866; GENBANK-AF124845

ENTRY MONTH:

200102

ENTRY DATE:

Entered STN: 20010322

Last Updated on STN: 20010322

Entered Medline: 20010222

AB ALS genes of *Candida albicans* encode a family of cell-surface glycoproteins with a three-domain structure. Each Als protein has a relatively conserved N-terminal domain, a central domain consisting of a tandemly repeated motif, and a serine-threonine-rich C-terminal domain that is relatively variable across the family. The ALS family exhibits several types of variability that indicate the importance of considering strain and allelic differences when studying ALS genes and their encoded proteins. Analysis of ALS5 provided additional evidence of variability within the ALS family. Comparison of the ALS5 sequence from two strains indicated sequence differences larger than strain or allelic mismatches observed for other *C. albicans* genes. Screening a collection of commonly used *C. albicans* strains and clinical isolates indicated that ALS5 is not present in several of these strains, supporting the conclusion that the Als protein profile is variable among *C. albicans* isolates. Physical mapping of ALS5 showed that it is located close to

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**ALS1** on chromosome 6. The N-terminal domain of Als5p was produced in *Pichia pastoris* to initiate structural analysis of this portion of the protein. The hydrophobic character of this portion of the protein was exploited in the purification scheme. Circular dichroism analysis of the purified, authenticated protein yielded a high content of antiparallel beta-sheet and little to no alpha-helical structure. These results are consistent with the conclusion that the N-terminal domain of Als5p has an immunoglobulin fold structure similar to that found in many cell adhesion molecules. Gene sequences of *C. albicans* ALS5 (Accession No. AF068866) and TPI1 (Accession No. AF124845) have been deposited in the GenBank database.

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L4 ANSWER 11 OF 27 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.  
ACCESSION NUMBER: 2000:347251 BIOSIS  
DOCUMENT NUMBER: PREV200000347251  
TITLE: Gene regulation during morphogenesis in *Candida albicans*.  
AUTHOR(S): Brown, Alistair J. P. (1); Barelle, Caroline J.; Budge, Susan; Duncan, James; Harris, Sheila; Lee, Philip R.; Leng, Ping; Macaskill, Susan; Murad, A. M. A.; Ramsdale, Mark; Wiltshire, Carolyn; Sishart, Jill A.; Gow, Neil A. R.  
CORPORATE SOURCE: (1) Department of Molecular and Cell Biology, Institute of Medical Sciences, University of Aberdeen, Aberdeen, Foresterhill, AB25 2ZD UK  
SOURCE: Ernst, Joachim F.; Schmidt, Axel. Contributions to Microbiology, (2000) Vol. 5, pp. 112-125. Contributions to Microbiology; Dimorphism in human pathogenic and apathogenic yeasts. print. Publisher: S. Karger AG P. O. Box, CH-4009, Basel, Switzerland.  
DOCUMENT TYPE: ISSN: 1420-9519. ISBN: 3-8055-6986-6 (cloth).  
LANGUAGE: Book  
SUMMARY LANGUAGE: English

L4 ANSWER 12 OF 27 MEDLINE DUPLICATE 7  
ACCESSION NUMBER: 2000138362 MEDLINE  
DOCUMENT NUMBER: 20138362 PubMed ID: 10672182  
TITLE: The cell wall architecture of *Candida albicans* wild-type cells and cell wall-defective mutants.  
AUTHOR: Kapteyn J C; Hoyer L L; Hecht J E; Muller W H; Andel A; Verkleij A J; Makarow M; Van Den Ende H; Klis F M  
CORPORATE SOURCE: Swammerdam Institute of Life Sciences, University of Amsterdam, Kruislaan 318, 1098 SM Amsterdam, The Netherlands.. kapteyn@bio.uva.nl  
CONTRACT NUMBER: AI39441 (NIAID)  
SOURCE: MOLECULAR MICROBIOLOGY, (2000 Feb) 35 (3) 601-11.  
PUB. COUNTRY: Journal code: 8712028. ISSN: 0950-382X.  
DOCUMENT TYPE: ENGLAND: United Kingdom  
LANGUAGE: Journal; Article; (JOURNAL ARTICLE)  
FILE SEGMENT: English  
ENTRY MONTH: Priority Journals  
ENTRY DATE: 200003  
ENTERED STN: Entered STN: 20000407

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Last Updated on STN: 20000407  
Entered Medline: 20000328

AB In *Candida albicans* wild-type cells, the betal, 6-glucanase-extractable glycosylphosphatidylinositol (GPI)-dependent cell wall proteins (CWP) account for about 88% of all covalently linked CWP. Approximately 90% of these GPI-CWP, including **Als1p** and **Als3p**, are attached via betal,6-glucan to betal,3-glucan. The remaining GPI-CWP are linked through betal,6-glucan to chitin. The betal,6-glucanase-resistant protein fraction is small and consists of Pir-related CWP, which are attached to betal,3-glucan through an alkali-labile linkage. Immunogold labelling and Western analysis, using an antiserum directed against *Saccharomyces cerevisiae* **Pir2p/Hsp150**, point to the localization of at least two differentially expressed **Pir2** homologues in the cell wall of *C. albicans*. In **mnn9Delta** and **pmt1Delta** mutant strains, which are defective in N- and O-glycosylation of proteins respectively, we observed enhanced chitin levels together with an increased coupling of GPI-CWP through betal,6-glucan to chitin. In these cells, the level of **Pir**-CWP was slightly upregulated. A slightly increased incorporation of **Pir** proteins was also observed in a betal,6-glucan-deficient hemizygous **kre6Delta** mutant. Taken together, these observations show that *C. albicans* follows the same basic rules as *S. cerevisiae* in constructing a cell wall and indicate that a cell wall salvage mechanism is activated when *Candida* cells are confronted with cell wall weakening.

L4 ANSWER 13 OF 27 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.  
ACCESSION NUMBER: 2001:12896 BIOSIS

DOCUMENT NUMBER: PREV200100012896

TITLE: Use of site-directed mutagenesis (SDM) to identify the endothelial cell-binding region of the *Candida albicans* **ALS1** gene product.

AUTHOR(S): Loza, L., Jr. (1); Filler, S. G. (1); Edwards, J. E., Jr. (1); Fu, Y. (1)

CORPORATE SOURCE: (1) Harbo-UCLA Res. and Ed. Inst., Torrance, CA USA  
SOURCE: Abstracts of the Interscience Conference on

Antimicrobial Agents and Chemotherapy, (2000) Vol. 40, pp. 397. print.

Meeting Info.: 40th Interscience Conference on Antimicrobial Agents and Chemotherapy Toronto, Ontario, Canada September 17-20, 2000

DOCUMENT TYPE: Conference

LANGUAGE: English

SUMMARY LANGUAGE: English

L4 ANSWER 14 OF 27 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.  
ACCESSION NUMBER: 2001:12894 BIOSIS

DOCUMENT NUMBER: PREV200100012894

TITLE: *Candida albicans* **ALS1** encodes an adhesin that regulates hyphal formation downstream of **EFG1**.

AUTHOR(S): Sheppard, D. C. (1); Fu, Y. (1); Ibrahim, A. S. (1); Filler, S. G. (1); Edwards, J. E., Jr. (1)

CORPORATE SOURCE: (1) Harbor-UCLA Res. and Ed. Inst., Torrance, CA USA  
SOURCE: Abstracts of the Interscience Conference on

Antimicrobial Agents and Chemotherapy, (2000) Vol.

09/715876

40, pp. 395. print.  
Meeting Info.: 40th Interscience Conference on  
Antimicrobial Agents and Chemotherapy Toronto,  
Ontario, Canada September 17-20, 2000

DOCUMENT TYPE: Conference  
LANGUAGE: English  
SUMMARY LANGUAGE: English

L4 ANSWER 15 OF 27 MEDLINE  
ACCESSION NUMBER: 2001334595 MEDLINE  
DOCUMENT NUMBER: 21220731 PubMed ID: 11320469  
TITLE: *Candida albicans* colonization of  
surface-sealed interim soft liners.  
AUTHOR: Olan-Rodriguez L; Minah G E; Driscoll C F  
CORPORATE SOURCE: Advanced Education Program in Prosthodontics,  
Department of Restorative Dentistry, University of  
Maryland, Baltimore, MD, USA.  
SOURCE: JOURNAL OF PROSTHODONTICS, (2000 Dec) 9 (4) 184-8.  
Journal code: 9301275. ISSN: 1059-941X.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Dental Journals  
ENTRY MONTH: 200108  
ENTRY DATE: Entered STN: 20010820  
Last Updated on STN: 20010820  
Entered Medline: 20010816

AB PURPOSE: This in-vivo investigation evaluated the effect of 2 denture sealer agents on the microbial colonization of a newly placed soft interim denture liner during a period of 14 days.  
MATERIALS AND METHODS: An interim soft denture liner (Coe-Soft; GC America, Alsip, IL) was coated with 2 different denture surface sealants (Palaseal [Heraeus Kulzer, Irvine, CA] and Mono-Poly [Plastodont, New York, NY]). Three rectangular wells of 1 cm wide x 2 cm long x 2 mm deep were placed in the intaglio of 10 maxillary complete dentures and filled with the soft liner material. The soft liner surface was treated with Palaseal (first well) and Mono-Poly (second well), and the unsealed (third well) was used as a control. These were exposed to the oral cavity for 14 days. The effect the sealant had in the prevention of Candidal colonization in vivo of the soft liner material was evaluated. Microbiological specimens were recovered from all samples and cultivated. Microbiological data from the control and 2-test samples in each denture were tabulated, and statistical analyses were performed.  
RESULTS: This investigation showed clear differences ( $p < .001$ ) between the sealed and unsealed soft liners. The sealed material showed significantly less colonization by yeast and bacteria. Intercomparison of the surface denture sealers, Palaseal versus Mono-Poly, showed no statistically significant differences ( $p < .005$ ) in total yeast or bacterial colonization. CONCLUSION: Coating of Coe-Soft denture liner with either Palaseal or Mono-Poly significantly decreased yeast and bacterial colonization. Copyright 2000 by The American College of Prosthodontists.

L4 ANSWER 16 OF 27 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.  
ACCESSION NUMBER: 2000:347134 BIOSIS  
DOCUMENT NUMBER: PREV200000347134  
TITLE: Characterization of *Candida*

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AUTHOR(S): *albicans* gene, Alal(Als5) and its protein.  
Byrd-Williams, P. B. (1); Gaur, N. K. (1); Klotz, S.  
A. (1); Henderson, R. L. (1); Moore, M. L. (1)  
CORPORATE SOURCE: (1) VA Medical Center, Kansas City, MO USA  
SOURCE: Abstracts of the General Meeting of the American  
Society for Microbiology, (2000) Vol. 100, pp. 73-74.  
print.  
Meeting Info.: 100th General Meeting of the American  
Society for Microbiology Los Angeles, California, USA  
May 21-25, 2000 American Society for Microbiology  
. ISSN: 1060-2011.  
DOCUMENT TYPE: Conference  
LANGUAGE: English  
SUMMARY LANGUAGE: English

L4 ANSWER 17 OF 27 MEDLINE DUPLICATE 8  
ACCESSION NUMBER: 2000253093 MEDLINE  
DOCUMENT NUMBER: 20253093 PubMed ID: 10790384  
TITLE: TUP1, CPH1 and EFG1 make independent contributions to  
filamentation in *candida albicans*

AUTHOR: Braun B R; Johnson A D  
CORPORATE SOURCE: Department of Microbiology, University of California,  
San Francisco, California 94143-0414, USA.  
CONTRACT NUMBER: GM-37049 (NIGMS)  
SOURCE: GENETICS, (2000 May) 155 (1) 57-67.  
Journal code: 0374636. ISSN: 0016-6731.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
ENTRY MONTH: 200007  
ENTRY DATE: Entered STN: 20000720  
Last Updated on STN: 20000720  
Entered Medline: 20000711

AB The common fungal pathogen, *Candida albicans*, can grow either as single cells or as filaments (hyphae), depending on environmental conditions. Several transcriptional regulators have been identified as having key roles in controlling filamentous growth, including the products of the TUP1, CPH1, and EFG1 genes. We show, through a set of single, double, and triple mutants, that these genes act in an additive fashion to control filamentous growth, suggesting that each gene represents a separate pathway of control. We also show that environmentally induced filamentous growth can occur even in the absence of all three of these genes, providing evidence for a fourth regulatory pathway. Expression of a collection of structural genes associated with filamentous growth, including HYR1, ECE1, HWP1, ALS1, and CHS2, was monitored in strains lacking each combination of TUP1, EFG1, and CPH1. Different patterns of expression were observed among these target genes, supporting the hypothesis that these three regulatory proteins engage in a network of individual connections to downstream genes and arguing against a model whereby the target genes are regulated through a central filamentous growth pathway. The results suggest the existence of several distinct types of filamentous forms of *C. albicans*, each dependent on a particular set of environmental conditions and each expressing a unique set of surface proteins.

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L4 ANSWER 18 OF 27 MEDLINE DUPLICATE 9  
ACCESSION NUMBER: 1999346221 MEDLINE  
DOCUMENT NUMBER: 99346221 PubMed ID: 10417199  
TITLE: Detection of Als proteins on the cell wall of  
**Candida albicans** in murine tissues.  
AUTHOR: Hoyer L L; Clevenger J; Hecht J E; Ehrhart E J;  
Poulet F M  
CORPORATE SOURCE: Department of Veterinary Pathobiology, University of  
Illinois, Urbana, Illinois, USA.. lhoyer@uiuc.edu  
CONTRACT NUMBER: AI39441 (NIAID)  
SOURCE: INFECTION AND IMMUNITY, (1999 Aug) 67 (8) 4251-5.  
Journal code: 0246127. ISSN: 0019-9567.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
ENTRY MONTH: 199908  
ENTRY DATE: Entered STN: 19990820  
Last Updated on STN: 19990820  
Entered Medline: 19990812  
AB A murine model of disseminated candidiasis was utilized to determine whether **Candida albicans** Als proteins are produced in vivo. The kidneys, spleen, heart, liver, and lungs were collected from mice inoculated with one of three *C. albicans* strains (SC5314, B311, or WO-1). Immunohistochemical analysis of murine tissues by using a rabbit polyclonal anti-Als serum indicated that Als proteins were produced by each *C. albicans* cell in the tissues examined. Patterns of staining with the anti-Als serum were similar among the *C. albicans* strains tested. These data indicated that Als protein production was widespread in disseminated candidiasis and that, despite strain differences in ALS gene expression previously noted in vitro, Als protein production in vivo was similar among *C. albicans* strains. The extensive production of Als proteins in vivo and their presence on the *C. albicans* cell wall position these proteins well for a role in host-pathogen interaction.

L4 ANSWER 19 OF 27 MEDLINE DUPLICATE 10  
ACCESSION NUMBER: 1999390319 MEDLINE  
DOCUMENT NUMBER: 99390319 PubMed ID: 10458989  
TITLE: Adhesins in **Candida albicans**.  
AUTHOR: Sundstrom P  
CORPORATE SOURCE: Department of Medical Microbiology and Immunology,  
Ohio State University, Columbus, OH 43210-1239, USA..  
sundstrom.1@osu.edu  
SOURCE: CURRENT OPINION IN MICROBIOLOGY, (1999 Aug) 2 (4)  
353-7. Ref: 35  
Journal code: 9815056. ISSN: 1369-5274.  
PUB. COUNTRY: ENGLAND: United Kingdom  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
General Review; (REVIEW)  
(REVIEW, TUTORIAL)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
ENTRY MONTH: 199909  
ENTRY DATE: Entered STN: 19990925  
Last Updated on STN: 19990925

09/715876

Entered Medline: 19990915

AB The adherent properties of **Candida albicans**  
blastoconidia and germ tubes have long been appreciated, but little  
is known about the mechanisms responsible for adherence. Recently,  
three genes, ALA1, ALS1 and HWP1, encoding proteins with  
adherent properties and motifs consistent with linkage to the  
beta-1, 6-glucan of *C. albicans* cell walls have provided  
insight into the topology of protein adhesins. Hwpl, a  
developmentally regulated adhesin of germ tubes and hyphae, attaches  
to buccal epithelial cells by an unconventional,  
transglutaminase-mediated mechanism of adhesion.

L4 ANSWER 20 OF 27 MEDLINE DUPLICATE 11  
ACCESSION NUMBER: 1998361950 MEDLINE  
DOCUMENT NUMBER: 98361950 PubMed ID: 9694829  
TITLE: Multiple functions of Pmt1p-mediated protein  
O-mannosylation in the fungal pathogen  
**Candida albicans**.  
AUTHOR: Timpel C; Strahl-Bolsinger S; Ziegelbauer K; Ernst J  
F  
CORPORATE SOURCE: Institut fur Mikrobiologie und Biologisch-  
Medizinisches Forschungszentrum, Heinrich-Heine-  
Universitat, D-40225 Dusseldorf, Germany.  
SOURCE: JOURNAL OF BIOLOGICAL CHEMISTRY, (1998 Aug 14) 273  
(33) 20837-46.  
Journal code: 2985121R. ISSN: 0021-9258.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
OTHER SOURCE: GENBANK-AF000232  
ENTRY MONTH: 199809  
ENTRY DATE: Entered STN: 19980925  
Last Updated on STN: 19980925  
Entered Medline: 19980914

AB Protein mannosylation by Pmt proteins initiates O-glycosylation in  
fungi. We have identified the PMT1 gene and analyzed the function of  
Pmt1p in the fungal human pathogen **Candida**  
**albicans**. Mutants defective in PMT1 alleles lacked Pmt in  
vitro enzymatic activity, showed reduced growth rates, and tended to  
form cellular aggregates. In addition, multiple specific  
deficiencies not known in *Saccharomyces cerevisiae* (including  
defective hyphal morphogenesis; supersensitivity to the antifungal  
agents hygromycin B, G418, clotrimazole, and calcofluor white; and  
reduced adherence to Caco-2 epithelial cells) were observed in pmt1  
mutants. PMT1 deficiency also led to faster electrophoretic mobility  
of the Als1p cell wall protein and to elevated  
extracellular activities of chitinase. Homozygous pmt1 mutants were  
avirulent in a mouse model of systemic infection, while heterozygous  
PMT1/pmt1 strains showed reduced virulence. The results indicate  
that protein O-mannosylation by Pmt proteins occurs in different  
fungal species, where PMT1 deficiency can lead to defects in  
multiple cellular functions.

L4 ANSWER 21 OF 27 MEDLINE DUPLICATE 12  
ACCESSION NUMBER: 1998440424 MEDLINE  
DOCUMENT NUMBER: 98440424 PubMed ID: 9765564  
TITLE: Identification of **Candida albicans**

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ALS2 and ALS4 and localization of als proteins to the  
fungal cell surface.  
AUTHOR: Hoyer L L; Payne T L; Hecht J E  
CORPORATE SOURCE: Department of Veterinary Pathobiology, University of  
Illinois, Urbana, Illinois, USA. lhoyer@uiuc.edu  
CONTRACT NUMBER: AI39441 (NIAID)  
SOURCE: JOURNAL OF BACTERIOLOGY, (1998 Oct) 180 (20) 5334-43.  
Journal code: 2985120R. ISSN: 0021-9193.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
OTHER SOURCE: GENBANK-AF024580; GENBANK-AF024581; GENBANK-AF024582;  
GENBANK-AF024583; GENBANK-AF024584; GENBANK-AF024585;  
GENBANK-AF024586; GENBANK-AF024587  
ENTRY MONTH: 199810  
ENTRY DATE: Entered STN: 19990106  
Last Updated on STN: 20000303  
Entered Medline: 19981030  
AB Additional genes in the growing ALS family of *Candida albicans* were isolated by PCR screening of a genomic fosmid library with primers designed from the consensus tandem-repeat sequence of **ALS1**. This procedure yielded fosmids encoding ALS2 and ALS4. ALS2 and ALS4 conformed to the three-domain structure of ALS genes, which consists of a central domain of tandemly repeated copies of a 108-bp motif, an upstream domain of highly conserved sequences, and a domain of divergent sequences 3' of the tandem repeats. Alignment of five predicted Als protein sequences indicated conservation of N- and C-terminal hydrophobic regions which have the hallmarks of secretory signal sequences and glycosylphosphatidylinositol addition sites, respectively. Heterologous expression of an N-terminal fragment of **Als1p** in *Saccharomyces cerevisiae* demonstrated function of the putative signal sequence with cleavage following Ala17. This signal sequence cleavage site was conserved in the four other Als proteins analyzed, suggesting identical processing of each protein. Primary-structure features of the five Als proteins suggested a cell-surface localization, which was confirmed by indirect immunofluorescence with an anti-Als antiserum. Staining was observed on mother yeasts and germ tubes, although the intensity of staining on the mother yeast decreased with elongation of the germ tube. Similar to other ALS genes, ALS2 and ALS4 were differentially regulated. ALS4 expression was correlated with the growth phase of the culture; ALS2 expression was not observed under many different *in vitro* growth conditions. The data presented here demonstrate that ALS genes encode cell-surface proteins and support the conclusion that the size and number of Als proteins on the *C. albicans* cell surface vary with strain and growth conditions.

L4 ANSWER 22 OF 27 MEDLINE DUPLICATE 13  
ACCESSION NUMBER: 1998187963 MEDLINE  
DOCUMENT NUMBER: 98187963 PubMed ID: 9529114  
TITLE: Expression of the *Candida albicans* gene **ALS1** in *Saccharomyces cerevisiae* induces adherence to endothelial and epithelial cells.  
AUTHOR: Fu Y; Rieg G; Fonzi W A; Belanger P H; Edwards J E Jr; Filler S G

09/715876

CORPORATE SOURCE: St. John's Cardiovascular Research Center, Department of Medicine, Harbor-UCLA Research and Education Institute, Torrance, California 90502, USA.

CONTRACT NUMBER: P01 AI-37194 (NIAID)  
R01AI-19990 (NIAID)  
R29 AI040636 (NIAID)

+

SOURCE: INFECTION AND IMMUNITY, (1998 Apr) 66 (4) 1783-6.  
Journal code: 0246127. ISSN: 0019-9567.

PUB. COUNTRY: United States

DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)

LANGUAGE: English

FILE SEGMENT: Priority Journals

ENTRY MONTH: 199804

ENTRY DATE: Entered STN: 19980416

Last Updated on STN: 19980416

Entered Medline: 19980409

AB To identify genes encoding adhesins that mediate the binding of *Candida albicans* to endothelial cells, a genomic library from this organism was constructed and used to transform *Saccharomyces cerevisiae*. These transformed organisms were screened for adherence to endothelial cells, and a highly adherent clone was identified. The adherence of this clone to endothelial cells was over 100-fold greater than that of control *S. cerevisiae* transformed with the empty plasmid. This clone also exhibited enhanced adherence to epithelial cells. The *C. albicans* gene contained within this clone was found to be **ALS1**. These results indicate that **ALS1** may encode a candidal adhesin.

L4 ANSWER 23 OF 27 MEDLINE DUPLICATE 14

ACCESSION NUMBER: 1998309840 MEDLINE

DOCUMENT NUMBER: 98309840 PubMed ID: 9644209

TITLE: *Candida albicans* ALS3 and

insights into the nature of the ALS gene family.

AUTHOR: Hoyer L L; Payne T L; Bell M; Myers A M; Scherer S

CORPORATE SOURCE: Department of Veterinary Pathobiology, University of Illinois at Urbana-Champaign, 2522 VMBSB, 2001 S. Lincoln Avenue, Urbana, IL 61802, USA..

lhoyer@uiuc.edu

CONTRACT NUMBER: AI23850 (NIAID)

AI39441 (NIAID)

SOURCE: CURRENT GENETICS, (1998 Jun) 33 (6) 451-9.  
Journal code: 8004904. ISSN: 0172-8083.

PUB. COUNTRY: United States

DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)

LANGUAGE: English

FILE SEGMENT: Priority Journals

OTHER SOURCE: GENBANK-U87956

ENTRY MONTH: 199808

ENTRY DATE: Entered STN: 19980828

Last Updated on STN: 20000303

Entered Medline: 19980814

AB The **ALS1** (agglutinin-like sequence) gene of *Candida albicans* encodes a protein similar to alpha-agglutinin, a cell-surface adhesion glycoprotein of *Saccharomyces cerevisiae* (Hoyer et al. 1995). A central domain of a tandemly repeated 108-bp sequence is found in the **ALS1** coding region. This tandem-repeat motif

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hybridizes to multiple *C. albicans* genomic DNA fragments, indicating the possibility of other **ALS1**-like genes in *C. albicans* (Hoyer et al. 1995). To determine if these fragments constitute a gene family, tandem-repeat-hybridizing genomic fragments were isolated from a fosmid library by PCR screening using primers based on the consensus tandem-repeat sequence of **ALS1** (Hoyer et al. 1995). One group of fosmids, designated **ALS3**, encodes a gene with 81% identity to **ALS1**. The sequences of **ALS1** and **ALS3** are most conserved in the tandem-repeat domain and in the region 5' of the tandem repeats. Northern-blot analysis using unique probes from the 3' end of each gene demonstrated that **ALS1** expression varies, depending on which *C. albicans* strain is examined, and that **ALS3** is hyphal-specific. Both genes are found in a variety of *C. albicans* and *C. stellatoidea* strains examined. The predicted **Als1p** and **Als3p** exhibit features suggesting that both are cell-surface glycoproteins. Southern blots probed with conserved sequences from the region 5' of the tandem repeats suggest that other **ALS**-like sequences are present in the *C. albicans* genome and that the **ALS** family may be larger than originally estimated.

L4 ANSWER 24 OF 27 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.  
ACCESSION NUMBER: 1998:416768 BIOSIS  
DOCUMENT NUMBER: PREV199800416768  
TITLE: Allelic frequencies and associations in  
*Candida albicans*.  
AUTHOR(S): Lott, T. J.; Holloway, B. P.; Elie, C. M.; Logan, D.  
CORPORATE SOURCE: CDC, Atlanta, GA USA  
SOURCE: Abstracts of the General Meeting of the American  
Society for Microbiology, (1998) Vol. 98, pp. 259.  
Meeting Info.: 98th General Meeting of the American  
Society for Microbiology Atlanta, Georgia, USA May  
17-21, 1998 American Society for Microbiology  
. ISSN: 1060-2011.  
DOCUMENT TYPE: Conference  
LANGUAGE: English

L4 ANSWER 25 OF 27 MEDLINE DUPLICATE 15  
ACCESSION NUMBER: 1998053977 MEDLINE  
DOCUMENT NUMBER: 98053977 PubMed ID: 9393828  
TITLE: Expression, cloning, and characterization of a  
*Candida albicans* gene, **ALA1**, that  
confers adherence properties upon *Saccharomyces*  
*cerevisiae* for extracellular matrix proteins.  
AUTHOR: Gaur N K; Klotz S A  
CORPORATE SOURCE: Research Service, Veterans Affairs Medical Center,  
Kansas City, Missouri 64128, USA.  
SOURCE: INFECTION AND IMMUNITY, (1997 Dec) 65 (12) 5289-94.  
Journal code: 0246127. ISSN: 0019-9567.  
PUB. COUNTRY: United States  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
OTHER SOURCE: GENBANK-AF025429  
ENTRY MONTH: 199801  
ENTRY DATE: Entered STN: 19980122  
Last Updated on STN: 20000303

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Entered Medline: 19980102  
AB Adherence of *Candida albicans* to host tissues is a necessary step for maintenance of its commensal status and is likely a necessary step in the pathogenesis of candidiasis. The extracellular matrix (ECM) proteins are some of the host tissue and plasma proteins to which *C. albicans* adheres through adhesins located on the fungal cell surface. To isolate genes encoding ECM adhesins, an assay was developed based on the ability of yeast cells to adhere to magnetic beads coated with the ECM protein fibronectin, type IV collagen, or laminin. A *C. albicans* genomic library was constructed by cloning XbaI-partially-digested and size-selected fragments into pAUR112, an Escherichia coli-yeast low-copy-number shuttle vector. The *C. albicans* library was transformed into *Saccharomyces cerevisiae* YPH 499, and clones capable of adherence were selected by using ECM protein-coated magnetic beads. A plasmid containing an approximately 8-kb insert was isolated from 29 adherent clones. These clones exhibited adherence to all ECM protein-coated magnetic beads and to human buccal epithelial cells. The ALA1 gene (for agglutinin-like adhesin) was localized by subcloning it into a 5-kb XbaI fragment which retained the adherence phenotype in both orientations. The complete DNA sequence of the 5-kb insert was determined, and an open reading frame (ORF) encoding 1,419 amino acid residues was identified. Deletions from the 5' and 3' ends extending into the DNA sequence encoding the 1,419-amino-acid ORF product inactivated the adherence phenotype, suggesting that it is the coding region of the ALA1 gene. A database search identified ALA1 to be similar to the *C. albicans* ALS1 (for agglutinin-like sequence 1) protein and the *S. cerevisiae* agglutinin protein (AG alpha1), although the homology at the primary amino acid sequence level is limited to the first half of each of these proteins. ALA1 contains a central domain of six tandem repeats of 36 amino acids. We discuss the significance of various predicted ALA1 structural motifs and their relationships to function in the adherence process.

L4 ANSWER 26 OF 27 MEDLINE DUPLICATE 16  
ACCESSION NUMBER: 95272392 MEDLINE  
DOCUMENT NUMBER: 95272392 PubMed ID: 7752895  
TITLE: *Candida albicans* ALS1:  
domains related to a *Saccharomyces cerevisiae* sexual agglutinin separated by a repeating motif.  
AUTHOR: Hoyer L L; Scherer S; Shatzman A R; Livi G P  
CORPORATE SOURCE: Human Genome Center, Lawrence Berkeley Laboratory, Berkeley, California 94720.  
CONTRACT NUMBER: AI23850 (NIAID)  
SOURCE: MOLECULAR MICROBIOLOGY, (1995 Jan) 15 (1) 39-54.  
Journal code: 8712028. ISSN: 0950-382X.  
PUB. COUNTRY: ENGLAND: United Kingdom  
DOCUMENT TYPE: Journal; Article; (JOURNAL ARTICLE)  
LANGUAGE: English  
FILE SEGMENT: Priority Journals  
OTHER SOURCE: GENBANK-L25902  
ENTRY MONTH: 199506  
ENTRY DATE: Entered STN: 19950629  
Last Updated on STN: 19950629  
Entered Medline: 19950621  
AB Transfer of budding *Candida albicans* yeast cells

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from the rich, complex medium YEPD to the defined tissue culture medium RPMI 1640 (RPMI) at 37 degrees C and 5% CO<sub>2</sub> causes rapid onset of hyphal induction. Among the genes induced under these conditions are hyphal-specific genes as well as genes expressed in response to changes in temperature, CO<sub>2</sub> and specific media components. A cDNA library constructed from cells incubated for 20 min in RPMI was differentially screened with yeast (YEPD)- and hyphal (RPMI)-specific probes resulting in identification of a gene expressed in response to culture conditions but not regulated by the yeast-hyphal transition. The deduced gene product displays significant identity to *Saccharomyces cerevisiae* alpha-agglutinin, encoded by AG alpha 1, an adhesion glycoprotein that mediates mating of haploid cells. The presence of this gene in *C. albicans* is curious since the organism has not been observed to undergo meiosis. We designate the *C. albicans* gene **ALS1** (for agglutinin-like sequence). While the N- and C-termini of the predicted 1260-amino-acid **ALS1** protein resemble those of the 650-amino-acid AG alpha 1, **ALS1** contains a central domain of tandem repeats consisting of a highly conserved 36-amino-acid sequence not present in AG alpha 1. These repeats are also present on the nucleotide level as a highly conserved 108 bp motif. Southern and Northern blot analyses indicate a family of *C. albicans* genes that contain the tandem repeat motif; at least one gene in addition to **ALS1** is expressed under conditions similar to those for **ALS1** expression. Genomic Southern blots from several *C. albicans* isolates indicate that the number of copies of the tandem repeat element in **ALS1** differs across strains and, in some cases, between **ALS1** alleles in the same strain, suggesting a strain-dependent variability in **ALS1** protein size. Potential roles for the **ALS1** protein are discussed.

L4 ANSWER 27 OF 27 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.  
ACCESSION NUMBER: 1978:136611 BIOSIS  
DOCUMENT NUMBER: BA65:23611  
TITLE: PERCURRENT PROLIFERATION OF SPORANGIOPHORES IN THE GENUS ALBUGO.  
AUTHOR(S): THAKUR S B  
CORPORATE SOURCE: DEP. BOT., RUPAREL COLL., BOMBAY 400016, MAHARASHTRA, INDIA.  
SOURCE: MYCOLOGIA, (1977) 69 (3), 637-641.  
CODEN: MYCOAE. ISSN: 0027-5514.  
FILE SEGMENT: BA; OLD  
LANGUAGE: English  
AB Sporangiogenesis in 5 spp. of *Albugo* is described. *A. bliti* (Biv.) Kuntze, *A. candida* (Pers.) Kuntze, *A. evolvuli* (Damle) Safee. & Thirum., *A. ipomoeae-aquatica* Sawada and *A. pestigridis* Gharse occurring on *Amaranthus polygamus* L. along with *Raphanus sativus* L., *Evolvulus alsinoides* Roxb., *Ipomoea aquatica* Forsk., and *I. pestigridis* L., respectively, were used for this study. The sporangia of *Albugo* spp. apparently are aleuriosporangia and the sporangiophores are annellosporangiophores.

(PHIN-EPLUS, MEDLINE, BIOSIS, EMBASE, WPIDS, JICST-EPLUS, JAPIO, TOX CENTER, PHIC, PHIN' ENTERED AT 09:55:39 ON 07 OCT 2002)

L5 11711 S EDWARDS J?/AU  
L6 23 S "FILER S"?/AU  
L7 1331 S CUTLER J?/AU

Author(s)

09/715876

L8 1501 S SHEPPARD D?/AU  
L9 2403 S IBRAHIM A?/AU  
L10 5724 S FU Y?/AU  
L11 250 S "FILLER S"?/AU  
L12 4 S L5 AND (L6 OR L11) AND L7 AND L8 AND L9 AND L10  
L13 168 S L5 AND (L6 OR L11 OR L7 OR L8 OR L9 OR L10)  
L14 60 S (L6 OR L11) AND (L7 OR L8 OR L9 OR L10)  
L15 4 S L7 AND (L8 OR L9 OR L10)  
L16 8 S L8 AND (L9 OR L10)  
L17 44 S L9 AND L10  
L18 11 S (L13 OR L14 OR L17) AND L1  
L19 13 S L12 OR L15 OR L16 OR L18  
L20 7 DUP REM L19 (6 DUPLICATES REMOVED).

L20 ANSWER 1 OF 7 HCPLUS COPYRIGHT 2002 ACS DUPLICATE 1  
ACCESSION NUMBER: 2002:355852 HCPLUS  
DOCUMENT NUMBER: 137:90678  
TITLE: *Candida albicans Als1p: An adhesin that is a downstream effector of the EFG1 filamentation pathway*  
AUTHOR(S): Fu, Yue; Ibrahim, Ashraf S.; Sheppard, Donald C.; Chen, Yee-Chun; French, Samuel W.; Cutler, Jim E.; Filler, Scott G.; Edwards, John E., Jr.  
CORPORATE SOURCE: Division of Infectious Diseases, St John's Cardiovascular Research Center, Harbor-UCLA Research and Education Institute, Torrance, CA, 90502, USA  
SOURCE: Molecular Microbiology (2002), 44(1), 61-72  
CODEN: MOMIEE; ISSN: 0950-382X  
PUBLISHER: Blackwell Science Ltd.  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Filamentation and adherence to host cells are crit. virulence factors of *Candida albicans*. Multiple filamentation regulatory pathways have been discovered in *C. albicans* using *Saccharomyces cerevisiae* as a model. In *S. cerevisiae*, these pathways converge on Flollp, which functions as a downstream effector of filamentation and also mediates cell-cell adherence (flocculation). In *C. albicans*, such effector(s) have not yet been identified. Here, we demonstrate that the cell surface protein Als1p is an effector of filamentation in *C. albicans*. We show that Als1p expression is controlled by the transcription factor Efg1p, which is known to be a key regulator of filamentation in *C. albicans*. Further, disruption of ALS1 inhibited filamentation, and autonomous expression of Als1p restored filamentation in an efg1 homozygous null mutant. Thus, Als1p functions as a downstream effector of the EFG1 filamentation pathway. In addn., we found that Als1p mediates both flocculation and adherence of *C. albicans* to endothelial cells in vitro. As a cell surface glycoprotein that mediates filamentation and adherence, Als1p has both structural and functional similarity to *S. cerevisiae* Flollp. Consistent with our in vitro results, Als1p was required for both normal filamentation and virulence in the mouse model of hematogenously disseminated candidiasis.  
REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE

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FOR THIS RECORD. ALL CITATIONS AVAILABLE  
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L20 ANSWER 2 OF 7 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.  
ACCESSION NUMBER: 2002:486908 BIOSIS  
DOCUMENT NUMBER: PREV200200486908  
TITLE: A functional analysis of the ALS5, ALS6 and ALS7  
genes of *Candida albicans*.  
AUTHOR(S): Sheppard, D. C. (1); Ibrahim, A. S.  
(1); Fu, Y. (1); Filler, S. G. (1);  
Edwards, J. E., Jr. (1)  
CORPORATE SOURCE: (1) Division of Infectious Diseases, Harbor-UCLA  
Research and Education Institute, Torrance, CA USA  
SOURCE: International Journal of Infectious Diseases, (June,  
2002) Vol. 6, No. Supplement 2, pp. 2S52-2S53.  
<http://www.isid.org/publications/ijid.shtml>. print.  
Meeting Info.: 12th International symposium on  
infections in the immunocompromised host Bergen,  
Norway June 23-26, 2002 International  
Immunocompromised Host Society  
. ISSN: 1201-9712.  
DOCUMENT TYPE: Conference  
LANGUAGE: English

L20 ANSWER 3 OF 7 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.  
ACCESSION NUMBER: 2002:486896 BIOSIS  
DOCUMENT NUMBER: PREV200200486896  
TITLE: Expression analysis of Agglutinin-  
Like Sequence 1 of *Candida albicans*.  
AUTHOR(S): Ibrahim, A. S. (1); Sheppard, D. C.  
(1); Fu, Y. (1); Edwards, J. E.,  
Jr. (1)  
CORPORATE SOURCE: (1) Harbor-UCLA Research and Education Institute,  
Torrance, CA USA  
SOURCE: International Journal of Infectious Diseases, (June,  
2002) Vol. 6, No. Supplement 2, pp. 2S47.  
<http://www.isid.org/publications/ijid.shtml>. print.  
Meeting Info.: 12th International symposium on  
infections in the immunocompromised host Bergen,  
Norway June 23-26, 2002 International  
Immunocompromised Host Society  
. ISSN: 1201-9712.  
DOCUMENT TYPE: Conference  
LANGUAGE: English

L20 ANSWER 4 OF 7 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.  
ACCESSION NUMBER: 2002:223311 BIOSIS  
DOCUMENT NUMBER: PREV200200223311  
TITLE: The chromosomal location of EFG1 has a major impact  
on the morphology and virulence of *Candida albicans*.  
AUTHOR(S): Sheppard, D. C. (1); Ibrahim, A. S.  
(1); Fu, Y. (1); Edwards, J. E. (1);  
Filler, S. G. (1)  
CORPORATE SOURCE: (1) Harbor-UCLA Research and Education Institute,  
Torrance, CA USA  
SOURCE: Abstracts of the General Meeting of the American  
Society for Microbiology, (2001) Vol. 101, pp. 364.  
<http://www.asmusa.org/mtgsrc/generalmeeting.htm>.

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print.

Meeting Info.: 101st General Meeting of the American Society for Microbiology Orlando, FL, USA May 20-24, 2001

ISSN: 1060-2011.

DOCUMENT TYPE: Conference  
LANGUAGE: English

AB Candida albicans strains containing disruptions in both copies of the gene encoding the transcription factor EFG1 have markedly impaired hyphal production, a reduced capacity to cause endothelial cell injury and attenuated virulence. Re-introduction of a single copy of EFG1 into the LEU2 locus of the efg1/efg1 strain only partially reconstitutes the wild-type phenotype. We investigated the relative contribution of gene locus to this phenomenon by constructing multiple strains in which a wild-type allele of EFG1 and its promoter were integrated at different loci. The allele was introduced into the efg1/efg1 strain at either the native (EFG1) locus, or one of two non-native loci: LEU2 or ARG4. Integration of EFG1 at the native locus resulted in complete reconstitution of filamentation with abundant hyphae formation in response to serum. However, strains containing EFG1 at either of the non-native loci formed only pseudohyphae under these conditions. Similarly, integration of EFG1 at the native locus restored the ability to induce endothelial cell damage to wild-type levels, while the strains containing EFG1 at the LEU2 or ARG4 loci caused markedly less endothelial damage (45% and 100% reduction in damage compared with wild-type, p>0.001). Finally, when studied in the mouse model of hematogenous candidiasis, the strain containing EFG1 at the native locus was as virulent as wild-type C. albicans. In contrast, the strains in which EFG1 was introduced at the LEU2 or ARG4 loci displayed significantly attenuated virulence. Northern blot analysis demonstrated reduced expression of an abnormally small EFG1 transcript in the strains containing EFG1 at the non-native loci. Thus, in C. albicans, the locus of integration is critical in studying gene function, and can result in significant alterations in phenotype both *in vitro* and *in vivo*.

L20 ANSWER 5 OF 7 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.

ACCESSION NUMBER: 2001:12896 BIOSIS

DOCUMENT NUMBER: PREV200100012896

TITLE: Use of site-directed mutagenesis (SDM) to identify the endothelial cell-binding region of the Candida albicans ALS1 gene product.

AUTHOR(S): Loza, L., Jr. (1); Filler, S. G. (1);  
Edwards, J. E., Jr. (1); Fu, Y. (1)

CORPORATE SOURCE: (1) Harbo-UCLA Res. and Ed. Inst., Torrance, CA USA  
SOURCE: Abstracts of the Interscience Conference on

Antimicrobial Agents and Chemotherapy, (2000) Vol.

40, pp. 397. print.

Meeting Info.: 40th Interscience Conference on  
Antimicrobial Agents and Chemotherapy Toronto,  
Ontario, Canada September 17-20, 2000

DOCUMENT TYPE: Conference

LANGUAGE: English

SUMMARY LANGUAGE: English

L20 ANSWER 6 OF 7 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.

ACCESSION NUMBER: 2001:12894 BIOSIS

09/715876

DOCUMENT NUMBER: PREV200100012894  
TITLE: *Candida albicans ALS1 encodes an adhesin that regulates hyphal formation downstream of EFG1.*  
AUTHOR(S): Sheppard, D. C. (1); Fu, Y. (1); Ibrahim, A. S. (1); Filler, S. G. (1); Edwards, J. E., Jr. (1)  
CORPORATE SOURCE: (1) Harbor-UCLA Res. and Ed. Inst., Torrance, CA USA  
SOURCE: Abstracts of the Interscience Conference on Antimicrobial Agents and Chemotherapy, (2000) Vol. 40, pp. 395. print.  
Meeting Info.: 40th Interscience Conference on Antimicrobial Agents and Chemotherapy Toronto, Ontario, Canada September 17-20, 2000  
DOCUMENT TYPE: Conference  
LANGUAGE: English  
SUMMARY LANGUAGE: English

L20 ANSWER 7 OF 7 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 2  
ACCESSION NUMBER: 1998:214170 HCAPLUS  
DOCUMENT NUMBER: 128:320030  
TITLE: Expression of the *Candida albicans* gene **ALS1** in *Saccharomyces cerevisiae* induces adherence to endothelial and epithelial cells  
AUTHOR(S): Fu, Yue; Rieg, Gunter; Fonzi, William A.; Belanger, Paul H.; Edwards, John E., Jr.; Filler, Scott G.  
CORPORATE SOURCE: St. John's Cardiovascular Research Center, Division of Infectious Diseases, Department of Medicine, Harbor-UCLA Research and Education Institute, Torrance, CA, 90502, USA  
SOURCE: Infection and Immunity (1998), 66(4), 1783-1786  
PUBLISHER: CODEN: INFIBR; ISSN: 0019-9567  
DOCUMENT TYPE: American Society for Microbiology  
LANGUAGE: Journal English

AB To identify genes encoding adhesins that mediate the binding of *Candida albicans* to endothelial cells, a genomic library from this organism was constructed and used to transform *Saccharomyces cerevisiae*. These transformed organisms were screened for adherence to endothelial cells, and a highly adherent clone was identified. The adherence of this clone to endothelial cells was over 100-fold greater than that of control *S. cerevisiae* transformed with the empty plasmid. This clone also exhibited enhanced adherence to epithelial cells. The *C. albicans* gene contained within this clone was **ALS1**. These results indicate that **ALS1** may encode a candidal adhesin.

(FILE 'HCAPLUS, MEDLINE, BIOSIS, EMBASE, WPIDS, JICST-EPLUS, JAPIO, TOXCENTER, PHIC, PHIN' ENTERED AT 10:52:24 ON 07 OCT 2002)  
L21 15 S (L5 OR L6 OR L11 OR L7 OR L8 OR L9 OR L10) AND L1  
L22 4 S L21 NOT L19  
L23 1 DUP REM L22 (3 DUPLICATES REMOVED)

L23 ANSWER 1 OF 1 HCAPLUS COPYRIGHT 2002 ACS DUPLICATE 1  
ACCESSION NUMBER: 2002:639230 HCAPLUS  
TITLE: Contribution of *Candida albicans* **ALS1** to the pathogenesis of experimental oropharyngeal candidiasis

09/715876

AUTHOR(S) : Kamai, Yasuki; Kubota, Mikie; Kamai, Yoko;  
Hosokawa, Tsunemichi; Fukuoka, Takashi;  
**Filler, Scott G.**

CORPORATE SOURCE: Biological Research Laboratories, Sankyo Co.,  
Ltd., Tokyo, 140-8710, Japan

SOURCE: Infection and Immunity (2002), 70(9), 5256-5258  
CODEN: INFIBR; ISSN: 0019-9567

PUBLISHER: American Society for Microbiology

DOCUMENT TYPE: Journal

LANGUAGE: English

AB We investigated the contribution of *Candida albicans* **ALS1**,  
which encodes a candidal adhesin, to the pathogenesis of exptl.  
murine oropharyngeal candidiasis. Our results indicate that the  
**ALS1** gene product is important for the adherence of the  
organism to the oral mucosa during the early stage of the infection.

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE  
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Alert feature enhanced for multiple files, etc. See HELP ALERT.  
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S2	37	S1 AND (CANDIDA OR ALBICANS OR KRUSEI OR TROPICALIS OR PAR- APSILOS?)
S3	24	RD (unique items)

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key terms

3/3,AB/1 (Item 1 from file: 35)  
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01870550 AADAAI1406782  
The identification of the endothelial-cell binding region of the  
\*Candida\*\*\* \*albicans\*\*\* \*ALS1\*\*\* gene product  
Author: Loza, Lucio, Jr.  
Degree: M.S.  
Year: 2001  
Corporate Source/Institution: California State University, Dominguez  
Hills (0582)  
Source: VOLUME 40/03 of MASTERS ABSTRACTS.  
PAGE 653. 58 PAGES  
ISBN: 0-493-41706-0

italic>\*Candida\*\*\* \*albicans\*\*\*</italic> causes serious infections in immunocompromised patients. These blood-borne organisms adhere to the endothelial cell lining of the blood vessels subsequently escaping and invading the deep tissues. This study investigated the mechanisms by which <italic>\*Candida\*\*\* \*albicans\*\*\*</italic> adheres to vascular endothelial cells in vitro.

The specific aim of this project is to identify the endothelial cell-binding region of the candidal adhesion gene product, \*Als1p\*\*\*. This was accomplished by constructing mutants of <italic>\*ALS1\*\*\*</italic> through the use of site-directed mutagenesis. The mutant constructs were

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transformed to the normally non-adhering <italic> S. cerevisiae</italic>. The adherence of the transformants was determined and compared to <italic>S. cerevisiae</italic> expressing the wild type \*Als1p\*\*\*. The binding region of \*Als1p\*\*\* is likely within the region of the N-terminus corresponding to amino acids 278 through 287. This study also determined that the presence of the tandem repeats of \*Als1p\*\*\* might contribute to its function as an adhesin.

3/3,AB/2 (Item 2 from file: 35)  
DIALOG(R)File 35:Dissertation Abs Online  
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01781048 AADAAIMQ49128  
Identification de gènes potentiellement impliqués dans le dimorphisme cellulaire de \*Candida\*\*\* \*albicans\*\*\* (French text)  
Author: Tremblay, Tammy-Lynn  
Degree: M.Sc.  
Year: 2000  
Corporate Source/Institution: Université Laval (Canada) (0726)  
Source: VOLUME 38/06 of MASTERS ABSTRACTS.  
PAGE 1547. 77 PAGES  
ISBN: 0-612-49128-5

La capacité de passer d'une forme levure ; une forme mycélienne est considérée comme importante dans la pathogénicité de <italic>\*Candida\*\*\* \*albicans\*\*\*</italic>. Dans le but d'identifier des gènes potentiellement impliqués dans le caractère du dimorphisme, l'expression de gènes fut comparée entre des cellules de type levuriforme et des cellules engagées dans la voie mycélienne par la technique du <italic>Differential Display</italic>. Des dix-sept fragments d'ADN isolés, onze se sont avérés exprimés plus intensément dans les cellules engagées dans la voie mycélienne que dans les cellules levuriformes. La séquence nucléotidique fut déterminée pour six de ces fragments d'ADN. Un seul des six fragments d'ADN identifiés correspondait à une gène de <italic>C. \*albicans\*\*\*</italic> identifiée; soit le " \*Candida\*\*\* \*albicans\*\*\* \*agglutinin\*\*\*-like" protein</italic> (ALS3). Parmi les cinq autres fragments identifiés, trois possédaient des cadres de lecture ayant une grande similarité avec des protéines de <italic>Sacharomyces cerevisiae</italic> la probable membrane protein YOR088w, une ARN hâtive ATP-dépendante et la putative phosphate-repressible phosphate permease YBR29C. Les deux autres fragments d'ADN avaient une similarité avec les séquences comprises dans les multiples banques de données.

3/3,AB/3 (Item 1 from file: 144)  
DIALOG(R)File 144:Pascal  
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14211617 PASCAL No.: 99-0412210  
Adhesins in \*Candida\*\*\* \*albicans\*\*\* : Host-microbe interactions:  
fungi/viruses/parasites

09/715876

SUNDSTROM P

Department of Medical Microbiology and Immunology, Ohio State University, Columbus, OH 43210-1239, United States

Journal: Current opinion in microbiology, 1999, 2 (4) 353-357

Language: English

The adherent properties of *\*Candida\*\*\* \*albicans\*\*\** blastoconidia and germ tubes have long been appreciated, but little is known about the mechanisms responsible for adherence. Recently, three genes, *ALA1*, *\*ALS1\*\*\** and *HWP1*, encoding proteins with adherent properties and motifs consistent with linkage to the beta-1,6-glucan of *C. \*albicans\*\*\** cell walls have provided insight into the topology of protein adhesins. *Hwp1*, a developmentally regulated adhesin of germ tubes and hyphae, attaches to buccal epithelial cells by an unconventional, transglutaminase-mediated mechanism of adhesion.

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3/3,AB/4 (Item 2 from file: 144)  
DIALOG(R)File 144:Pascal  
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13561043 PASCAL No.: 98-0263005

Expression of the *\*Candida\*\*\* \*albicans\*\*\** gene *\*ALS1\*\*\** in *Saccharomyces cerevisiae* induces adherence to endothelial and epithelial cells  
YUE FU; RIEG G; FONZI W A; BELANGER P H; EDWARDS J E JR; FILLER S G  
St. John's Cardiovascular Research Center, Division of Infectious Diseases, Department of Medicine, Harbor-UCLA Research and Education Institute, Torrance, California 90502, United States; Department of Microbiology and Immunology, Georgetown University, Washington, D.C. 20007, United States; UCLA School of Medicine, Los Angeles, California 90024, United States

Journal: Infection and immunity, 1998, 66 (4) 1783-1786

Language: English

To identify genes encoding adhesins that mediate the binding of *\*Candida\*\*\* \*albicans\*\*\** to endothelial cells, a genomic library from this organism was constructed and used to transform *Saccharomyces cerevisiae*. These transformed organisms were screened for adherence to endothelial cells, and a highly adherent clone was identified. The adherence of this clone to endothelial cells was over 100-fold greater than that of control *S. cerevisiae* transformed with the empty plasmid. This clone also exhibited enhanced adherence to epithelial cells. The *C. \*albicans\*\*\** gene contained within this clone was found to be *\*ALS1\*\*\**. These results indicate that *\*ALS1\*\*\** may encode a candidal adhesin.

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3/3,AB/5 (Item 3 from file: 144)  
DIALOG(R)File 144:Pascal  
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13364238 PASCAL No.: 98-0092620

Expression, cloning, and characterization of a *\*Candida\*\*\* \*albicans\*\*\** gene, *ALA1*, that confers adherence properties upon *Saccharomyces cerevisiae* for extracellular matrix proteins

GAUR N K; KLOTZ S A

Research Service, Veterans Affairs Medical Center, Kansas City, Missouri,

09/715876

United States; Department of Medicine, University of Kansas School of Medicine, Kansas City, Kansas, United States; Department of Microbiology, University of Kansas School of Medicine, Kansas City, Kansas, United States  
Journal: Infection and immunity, 1997, 65 (12) 5289-5294

Language: English

Adherence of *Candida*"\*\* *albicans*"\*\* to host tissues is a necessary step for maintenance of its commensal status and is likely a necessary step in the pathogenesis of candidiasis. The extracellular matrix (ECM) proteins are some of the host tissue and plasma proteins to which *C. albicans*"\*\* adheres through adhesins located on the fungal cell surface. To isolate genes encoding ECM adhesins, an assay was developed based on the ability of yeast cells to adhere to magnetic beads coated with the ECM protein fibronectin, type IV collagen, or laminin. A *C. albicans*"\*\* genomic library was constructed by cloning XbaI-partially-digested and size-selected fragments into PAUR112, an Escherichia coli-yeast low-copy-number shuttle vector. The *C. albicans*"\*\* library was transformed into *Saccharomyces cerevisiae* YPH 499, and clones capable of adherence were selected by using ECM protein-coated magnetic beads. A plasmid containing an similar 8-kb insert was isolated from 29 adherent clones. These clones exhibited adherence to all ECM protein-coated magnetic beads and to human buccal epithelial cells. The ALA1 gene (for "agglutinin"-like"\*\* adhesin) was localized by subcloning it into a 5-kb XbaI fragment which retained the adherence phenotype in both orientations. The complete DNA sequence of the 5-kb insert was determined, and an open reading frame (ORF) encoding 1,419 amino acid residues was identified. Deletions from the 5' and 3' ends extending into the DNA sequence encoding the 1,419-amino-acid ORF product inactivated the adherence phenotype, suggesting that it is the coding region of the ALA1 gene. A database search identified ALA1 to be similar to the *C. albicans*"\*\* "ALS1"\*\* (for "agglutinin"-like"\*\* sequence 1) protein and the *S. cerevisiae* agglutinin protein (AG alpha 1), although the homology at the primary amino acid sequence level is limited to the first half of each of these proteins. ALA1 contains a central domain of six tandem repeats of 36 amino acids. We discuss the significance of various predicted ALA1 structural motifs and their relationships to function in the adherence process.

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3/3,AB/6 (Item 1 from file: 266)  
DIALOG(R)File 266:FEDRIP  
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00294992

IDENTIFYING NO.: 5R01AI37201-07 AGENCY CODE: CRISP  
SALMONELLA VACCINES THAT DELIVER BOTH ANTIGEN AND CYTOKINE  
PRINCIPAL INVESTIGATOR: HEFFRON, FRED L  
ADDRESS: OREGON HEALTH SCIENCE UNIV 3181 SW SAM JACKSON PARK RD PORTLAND,  
OR 97201-3098  
PERFORMING ORG.: OREGON HEALTH & SCIENCE UNIVERSITY, PORTLAND, OREGON  
SPONSORING ORG.: NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES  
FY : 2001  
SUMMARY: This proposal for a Mycology Research Unit (MRU) is focused on a comprehensive effort to identify and evaluate the ability the ability of candidate antigens to produce protective immunity against hematogenously disseminated candidiasis. The driving forces behind this effort are the high frequency of candidal infections , the attractiveness of a future DNA vaccine strategy, and the need for treatment approaches that will minimize

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the development of antifungal resistance. Project 1 builds on the discovery during the current grant period that antibody response to certain epitopes of the phosphomannan complex of *C. albicans*\*\* enhances resistance to experimental disseminated candidiasis. Approaches for the proposed period include: i) use of stabilized liposomal constructs to improve the liposomal vaccine formulations, ii) production of protein conjugates of the critical mannan epitopes, and iii) construction of a DNA vaccine based on peptide mimotopes of the "protective" mannan epitopes. Project 2 is based on the central hypothesis that the ASL (agglutinin mimotopes of the "protective" mannan epitopes. Project 2 is based on the central hypothesis that the ASL (\*agglutinin"\*\* \*like"\*\* sequence) gene family of *\*Candida*\*\* contains genes that encode dominant adhesions of *\*Candida*\*\* for a variety of host constituents. Gene products of the ALS gene family will be evaluated as potential vaccine targets for both active and passive immunization. The active immunization will be accomplished using DNA vaccine approaches and may be used in combination with phosphomannan antigens identified in project 1 to optimize an immune response. Project 3 will utilize the ability of affinity-purify large amounts of anti-mannan antibodies from human plasma to directly test the biological activities of these antibodies and the contribution to protection of the fine epitope specificity of human anti-mannan antibody. Project 4 utilizes highly innovative molecular biology strategies to identify yet undiscovered cell surface proteins that may be attractive vaccine targets. Genes that are expressed during infection will be identified by screening of random fusion genes. Comparison of functional sequences to the *C. albicans*\*\* genomic sequence will permit identification of likely secreted, cell wall, and transmembrane proteins, available for interaction with antibody. These gene products can then be used either alone or in combination with other target immunogens to develop effective vaccines. This technology lends itself well to the incorporation of multiple candidate immunogens into DNA vaccines.

3/3,AB/7 (Item 2 from file: 266)  
DIALOG(R)File 266:FEDRIP  
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00294987  
IDENTIFYING NO.: 5P01AI37194-07 0001 AGENCY CODE: CRISP  
\*CANDIDA"\*\* ALS GENE PRODUCTS AS TARGET IMMUNOGENS  
PRINCIPAL INVESTIGATOR: EDWARDS, JOHN E., JR  
ADDRESS: HARBOR-UCLA RESEARCH & EDUC INST 1000 W CARSON STREET TORRANCE, CA 90509  
PERFORMING ORG.: HARBOR-UCLA RESEARCH & EDUC INST, TORRANCE, CALIFORNIA  
SPONSORING ORG.: NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES  
FY : 2001  
SUMMARY: While potent antifungal agents exist that are microbicidal for *\*Candida*\*\*, the attributable mortality of candidemia is approximately 38%, even with currently available antifungal therapy. The use of either passive or active immuno-therapy against *\*Candida*\*\* is a promising alternative to standard anti-fungal therapy of its potential to avoid the problems associated with heavy use of antifungal agents. Our long range goal is to identify dominant candidal adhesions and use these adhesions as targets for active or passive immunotherapy for serious candidal infections. During the current project period, we determined that the *C. albicans*\*\* gene, *\*ALS1*\*\*, likely encodes an adhesin that mediated attachment to endothelial and epithelial cells. This gene is a member of the ALS gene family. To date, approximately 11 members of the ALS gene

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family have been identified. However, the sequence of only two of these genes have been published. It is our central hypothesis that the ALS gene family encodes the major adhesion of *C. albicans*\*\*. It is likely that the different ALS proteins mediate adherence to different host constituent ligands. We propose to systematically examine selected members of the ALS gene family to determine which of them encode adhesins that mediate the binding of *C. albicans*\*\* to endothelium epithelium, and other host constituents. This information will be used to develop techniques to block the adherence of the organism to host tissues by using either passive or active immunization. The Specific Aims for this project are to i) obtain the full-length sequence of ALS6 and ALS94-98; ii) determine if the above ALS genes encode adhesions to endothelial cells, epithelial cells and selected other host constituents, and determine the ligands on the cell surface to which they bind; iii) determine if antibodies against specific ALS proteins block the adherence of *C. albicans*\*\* to endothelial and epithelial cells, and the selected host constituents in vitro; and iv) determine if antibodies against specific ALS proteins protect mice from mucosal and hematogenous disseminated candidal infections. We will identify adhesion as targets for active and passive immunization strategies. These adhesins are highly attractive targets for immunotherapy by themselves, have the potential to be used in combination with the targets identified by other projects in the Mycology Research Unit.

3/3,AB/8 (Item 1 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
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14529564 Document Delivery Available: 000177491100062 References: 12  
TITLE: Contribution of *\*Candida*\*\* *\*albicans*\*\* *\*ALS1*\*\* to the  
pathogenesis of experimental oropharyngeal candidiasis  
AUTHOR(S): Kamai Y (REPRINT); Kubota M; Kamai Y; Hosokawa T; Fukuoka T;  
Filler SG  
AUTHOR(S) E-MAIL: ykamai@shina.sankyo.co.jp  
CORPORATE SOURCE: Sankyo Co Ltd, Shinagawa Ku, 2-58 Hiromachi 1 Chome/Tokyo  
1408710//Japan/ (REPRINT); Sankyo Co Ltd, Shinagawa Ku, /Tokyo  
1408710//Japan/; Sankyo Co Ltd, Shinagawa Ku, /Tokyo 1408710//Japan/;  
Harbor UCLA Res & Educ Inst, /Torrance//CA/90502  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: INFECTION AND IMMUNITY, 2002, V70, N9 (SEP), P5256-5258  
GENUINE ARTICLE#: 584WE  
PUBLISHER: AMER SOC MICROBIOLOGY, 1752 N ST NW, WASHINGTON, DC 20036-2904  
USA  
ISSN: 0019-9567  
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: We investigated the contribution of *\*Candida*\*\* *\*albicans*\*\* *\*ALS1*\*\*, which encodes a candidal adhesin, to the pathogenesis of experimental murine oropharyngeal candidiasis. Our results indicate that the *\*ALS1*\*\* gene product is important for the adherence of the organism to the oral mucosa during the early stage of the infection.

3/3,AB/9 (Item 2 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
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14482585 Document Delivery Available: 000177381800001 References: 51

09/715876

TITLE: Adhesion in *\*Candida\*\*\* spp*  
AUTHOR(S): Sundstrom P (REPRINT)  
AUTHOR(S) E-MAIL: sundstrom.1@osu.edu  
CORPORATE SOURCE: Ohio State Univ, Dept Mol Virol Immunol & Med Genet,  
/Columbus//OH/43210 (REPRINT); Ohio State Univ, Dept Mol Virol Immunol &  
Med Genet, /Columbus//OH/43210; Ohio State Univ, Dept Microbiol,  
/Columbus//OH/43210  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: CELLULAR MICROBIOLOGY, 2002, V4, N8 (AUG), P461-469  
GENUINE ARTICLE#: 582ZV  
PUBLISHER: BLACKWELL PUBLISHING LTD, P O BOX 88, OSNEY MEAD, OXFORD OX2  
ONE, OXON, ENGLAND  
ISSN: 1462-5814  
LANGUAGE: English DOCUMENT TYPE: REVIEW

ABSTRACT: Microbial adherence is one of the most important determinants of pathogenesis, yet very few adhesins have been identified from fungal pathogens. Four structurally related adhesins, Hwp1, Alalp/Als5p, \*Als1p\*\*\*, from *\*Candida\*\*\* \*albicans\*\*\** and Epalp from *\*Candida\*\*\* glabrata*, are members of a class of proteins termed glycosylphosphatidylinositol-dependent cell wall proteins (GPI-CWP). These proteins have N-terminal signal peptides and C-terminal features that mediate glycosylphosphatidylinositol (GPI) membrane anchor addition, as well as other determinants leading to attachment to cell wall glucan. While common signalP/GPI motifs facilitate cell surface expression, unique features mediate ligand binding specificities of adhesins. The first glimpse of structural features of putative adhesins has come from biophysical characterizations of the N-terminal domain of Als5p. One protein not in the GPI-CWP class that was initially described as an adhesin, Int1p, has recently been shown to be similar to Bud4p of *Saccharomyces cerevisiae* in primary amino acid sequence, in co-localizing with septins and in functioning in bud site selection. Progress in understanding the role of adhesins in oroesophageal candidiasis has been made for Hwp1 in a study using beige athymic and transgenic epsilon 26 mice that have combined defects in innate and acquired immune responses. Searches of the *C. \*albicans\*\*\** genome for proteins in the GPI-CWP class has led to the identification of a subset of genes that will be the focus of future efforts to identify new *\*Candida\*\*\** adhesins.

3/3,AB/10 (Item 3 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
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13808482 Document Delivery Available: 000175052300006 References: 31  
TITLE: *\*Candida\*\*\* \*albicans\*\*\* \*Als1p\*\*\*: an adhesin that is a downstream effector of the EFG1 filamentation pathway*  
AUTHOR(S): Fu Y (REPRINT); Ibrahim AS; Sheppard DC; Chen YC; French SW; Cutler JE; Filler SG; Edwards JE  
AUTHOR(S) E-MAIL: Yue.Fu@humc.edu; Ibrahim@humc.edu  
CORPORATE SOURCE: Harbor UCLA Res & Educ Inst, Div Infect Dis, Bldg RB2, 1124 W Carson St/Torrance//CA/90502 (REPRINT); Harbor UCLA Res & Educ Inst, Div Infect Dis, /Torrance//CA/90502; Univ Calif Los Angeles, Sch Med, /Los Angeles//CA/90024; Montana State Univ, Dept Microbiol, /Bozeman//MT/59717  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: MOLECULAR MICROBIOLOGY, 2002, V44, N1 (APR), P61-72  
GENUINE ARTICLE#: 542PB

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PUBLISHER: BLACKWELL PUBLISHING LTD, P O BOX 88, OSNEY MEAD, OXFORD OX2  
ONE, OXON, ENGLAND  
ISSN: 0950-382X  
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: Filamentation and adherence to host cells are critical virulence factors of *\*Candida\*\*\* \*albicans\*\*\**. Multiple filamentation regulatory pathways have been discovered in *C. \*albicans\*\*\** using *Saccharomyces cerevisiae* as a model. In *S. cerevisiae*, these pathways converge on *Flo11p*, which functions as a downstream effector of filamentation and also mediates cell-cell adherence (flocculation). In *C. \*albicans\*\*\**, such effector(s) have not yet been identified. Here, we demonstrate that the cell surface protein *\*Als1p\*\*\** is an effector of filamentation in *C. \*albicans\*\*\**. We show that *\*Als1p\*\*\** expression is controlled by the transcription factor *Efg1p*, which is known to be a key regulator of filamentation in *C. \*albicans\*\*\**. Further, disruption of *\*ALS1\*\*\** inhibited filamentation, and autonomous expression of *\*Als1p\*\*\** restored filamentation in an *eef1* homozygous null mutant. Thus, *\*Als1p\*\*\** functions as a downstream effector of the *EFG1* filamentation pathway. In addition, we found that *\*Als1p\*\*\** mediates both flocculation and adherence of *C. \*albicans\*\*\** to endothelial cells in vitro. As a cell surface glycoprotein that mediates filamentation and adherence, *\*Als1p\*\*\** has both structural and functional similarity to *S. cerevisiae Flo11p*. Consistent with our in vitro results, *\*Als1p\*\*\** was required for both normal filamentation and virulence in the mouse model of haematogenously disseminated candidiasis.

3/3,AB/11 (Item 4 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
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13018056 References: 49  
TITLE: Biofilm formation by the fungal pathogen *\*Candida\*\*\* \*albicans\*\*\**:  
Development, architecture, and drug resistance  
AUTHOR(S): Chandra J; Kuhn DM; Mukherjee PK; Hoyer LL; McCormick T;  
Ghannoum MA (REPRINT)  
AUTHOR(S) E-MAIL: mag3@po.cwru.edu  
CORPORATE SOURCE: Univ Hosp Cleveland, Ctr Med Mycol, 11100 Euclid  
Ave/Cleveland//OH/44106 (REPRINT); Univ Hosp Cleveland, Ctr Med Mycol,  
/Cleveland//OH/44106; Case Western Reserve Univ, Dept Dermatol,  
/Cleveland//OH/44106; Univ Hosp Cleveland, Div Infect Dis,  
/Cleveland//OH/44106; Univ Illinois, Dept Vet Pathobiol,  
/Urbana//IL/61802  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: JOURNAL OF BACTERIOLOGY, 2001, V183, N18 (SEP), P5385-5394  
GENUINE ARTICLE#: 467WT  
PUBLISHER: AMER SOC MICROBIOLOGY, 1752 N ST NW, WASHINGTON, DC 20036-2904  
USA  
ISSN: 0021-9193  
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: Biofilms are a protected niche for microorganisms, where they are safe from antibiotic treatment and can create a source of persistent infection. Using two clinically relevant *\*Candida\*\*\* \*albicans\*\*\** biofilm models formed on bioprosthetic materials, we demonstrated that biofilm formation proceeds through three distinct developmental phases. These growth phases transform adherent blastospores to well-defined cellular communities encased in a polysaccharide matrix. Fluorescence and confocal

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scanning laser microscopy revealed that *C. albicans*"\*\* biofilms have a highly heterogeneous architecture composed of cellular and noncellular elements. In both models, antifungal resistance of biofilm-grown cells increased in conjunction with biofilm formation. The expression of "agglutinin"\*\*-\*like"\*\* (\*ALS"\*\*) genes, which encode a family of proteins implicated in adhesion to host surfaces, was differentially regulated between planktonic and biofilm-grown cells. The ability of *C. albicans*"\*\* to form biofilms contrasts sharply with that of *Saccharomyces cerevisiae*, which adhered to bioprosthetic surfaces but failed to form a mature biofilm. The studies described here form the basis for investigations into the molecular mechanisms of "Candida"\*\* biofilm biology and antifungal resistance and provide the means to design novel therapies for biofilm-based infections.

3/3,AB/12 (Item 5 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
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12638954 References: 52  
TITLE: Characterization of "agglutinin"\*\*-\*like"\*\* sequence genes from non-  
"albicans"\*\* "Candida"\*\* and phylogenetic analysis of the ALS family  
AUTHOR(S): Hoyer LL (REPRINT); Fundyga R; Hecht JE; Kapteyn JC; Klis FM;  
Arnold J  
AUTHOR(S) E-MAIL: lhoyer@uiuc.edu  
CORPORATE SOURCE: 2522 VMSB, 2001 S Lincoln Ave, /Urbana//IL/61802  
(REPRINT); Univ Illinois, Dept Vet Pathobiol, /Urbana//IL/61802; Univ  
Georgia, Dept Genet, /Athens//GA/30602; Univ Amsterdam, Swammerdam Inst  
Life Sci, /NL-1098 SM Amsterdam//Netherlands/  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: GENETICS, 2001, V157, N4 (APR), P1555-1567  
GENUINE ARTICLE#: 424GD  
PUBLISHER: GENETICS, 428 EAST PRESTON ST, BALTIMORE, MD 21202 USA  
ISSN: 0016-6731  
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: The "ALS"\*\* ("agglutinin"\*\*-\*like"\*\* sequence) gene family of "Candida"\*\* "albicans"\*\* encodes cell-surface glycoproteins implicated in adhesion of the organism to host surfaces. Southern blot analysis with ALS-specific probes suggested the presence of ALS gene families in *C. dubliniensis* and *C. tropicalis*"; three partial ALS genes were isolated from each organism. Northern blot analysis demonstrated that mechanisms governing expression of ALS genes in *C. albicans*"\*\* and *C. dublinensis* are different. Western blots with an anti-Als serum showed that cross-reactive proteins are linked by beta1,6-glucan in the cell wall of each non- "albicans"\*\* "Candida"\*\*, suggesting similar cell wall architecture and conserved processing of Als proteins in these organisms. Although the ALS family is present in each organism, phylogenetic analysis of the *C. albicans*"\*\*. *C. dubliniensis*, and *C. tropicalis*"\*\* ALS genes indicated that, within each species, sequence diversification in extensive and unique ALS sequences have arisen. Phylogenetic analysis of the ALS and SAP (secreted aspartyl proteinase) families show that the ALS family is younger than the SAP family. ALS genes in *C. albicans*"\*\*, *C. dubliniensis*, and *C. tropicalis*"\*\* tend to be located on chromosomes that also encode genes from the SAP family, yet the two families have unexpectedly different evolutionary histories. Homologous recombination between the tandem repeat sequences present in ALS genes could explain the different histories for co-localized genes in a predominantly clonal organism like *C. albicans*.

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3/3,AB/13 (Item 6 from file: 440)  
DIALOG(R) File 440:Current Contents Search(R)  
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12372391 References: 48  
TITLE: The ALS5 gene of *\*Candida\*\*\* \*albicans\*\*\** and analysis of the Als5p  
N-terminal domain  
AUTHOR(S): Hoyer LL (REPRINT); Hecht JE  
AUTHOR(S) E-MAIL: lhoyer@uiuc.edu  
CORPORATE SOURCE: Univ Illinois, Dept Vet Pathobiol, 2522 VMBSB, 2001 S  
Lincoln Ave/Urbana//IL/61802 (REPRINT); Univ Illinois, Dept Vet  
Pathobiol, /Urbana//IL/61802  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: YEAST, 2001, V18, N1 (JAN 15), P49-60  
GENUINE ARTICLE#: 394HK  
PUBLISHER: JOHN WILEY & SONS LTD, BAFFINS LANE CHICHESTER, W SUSSEX PO19  
1UD, ENGLAND  
ISSN: 0749-503X  
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: ALS genes of *\*Candida\*\*\* \*albicans\*\*\** encode a family of cell-surface glycoproteins with a three-domain structure. Each Als protein has a relatively conserved N-terminal domain, a central domain consisting of a tandemly repeated motif, and a serine-threonine-rich C-terminal domain that is relatively variable across the family. The ALS family exhibits several types of variability that indicate the importance of considering strain and allelic differences when studying ALS genes and their encoded proteins. Analysis of ALS5 provided additional evidence of variability within the ALS family. Comparison of the ALS5 sequence from two strains indicated sequence differences larger than strain or allelic mismatches observed for other C, *\*albicans\*\*\** genes. Screening a collection of commonly used C, *\*albicans\*\*\** strains and clinical isolates indicated that ALS5 is not present in several of these strains, supporting the conclusion that the Als protein profile is variable among C, *\*albicans\*\*\** isolates. Physical mapping of, ALS5 shelved that it is located close to *\*ALS1\*\*\** on chromosome 6, The N-terminal domain of Als5p vc; as produced in *Pichia pastoris* to initiate structural analysis of this portion of the protein. The hydrophobic character of this portion of the protein was exploited in the purification scheme. Circular dichroism analysis of the purified, authenticated protein yielded a high content of antiparallel beta -sheet and Little to no alpha -helical structure. These results are consistent with the conclusion that the N-terminal domain of Als5p has an immunoglobulin fold structure similar to that found in many cell adhesion molecules. Gene sequences of C, *\*albicans\*\*\** ALS5 (Accession No. AF068866) and TPI1 (Accession No. AF124845) have been deposited in the GenBank database. Copyright (C) 2000 John Wiley & Sons, Ltd.

3/3,AB/14 (Item 7 from file: 440)  
DIALOG(R) File 440:Current Contents Search(R)  
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11604929 References: 55  
TITLE: TUP1, CPH1 and EFG1 make independent contributions to filamentation  
in *\*Candida\*\*\* \*albicans\*\*\**  
AUTHOR(S): Braun BR; Johnson AD (REPRINT)

09/715876

AUTHOR(S) E-MAIL: ajohnson@socrates.ucsf.edu  
CORPORATE SOURCE: Univ Calif San Francisco, Dept Microbiol, S-410, 513  
Parnassus Ave/San Francisco//CA/94143 (REPRINT); Univ Calif San  
Francisco, Dept Microbiol, /San Francisco//CA/94143  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: GENETICS, 2000, V155, N1 (MAY), P57-67  
GENUINE ARTICLE#: 311DH  
PUBLISHER: GENETICS, 428 EAST PRESTON ST, BALTIMORE, MD 21202 USA  
ISSN: 0016-6731  
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: The common fungal pathogen, *\*Candida\*\*\* \*albicans\*\*\**, can grow either as single cells or as filaments (hyphae), depending on environmental conditions. Several transcriptional regulators have been identified as having key roles in controlling filamentous growth, including the products of the TUP1, CPH1, and EFG1 genes. We show, through a set of single, double, and triple mutants, that these genes act in an additive fashion to control filamentous growth, suggesting that each gene represents a separate pathway of control. We also show that environmentally induced filamentous growth can occur even in the absence of all three of these genes, providing evidence for a fourth regulatory pathway. Expression of a collection of structural genes associated with filamentous growth, including HYR1, ECE1, HWP1, *\*ALS1\*\*\**, and CHS2, was monitored in strains lacking each combination of TUP1, EFG1, and CPH1. Different patterns of expression were observed among these target genes, supporting the hypothesis that these three regulatory proteins engage in a network of individual connections to downstream genes and arguing against a model whereby the target genes are regulated through a central filamentous growth pathway. The results suggest the existence of several distinct types of filamentous forms of *C. albicans\*\*\**, each dependent on a particular set of environmental conditions and each expressing a unique set of surface proteins.

3/3,AB/15 (Item 8 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
(c) 2002 Inst for Sci Info. All rts. reserv.

11365609 References: 52  
TITLE: The cell wall architecture of *\*Candida\*\*\* \*albicans\*\*\** wild-type cells and cell wall-defective mutants  
AUTHOR(S): Kapteyn JC (REPRINT); Hoyer LL; Hecht JE; Muller WH; Andel A;  
Verkleij AJ; Makarow M; Van Den Ende H; Klis FM  
AUTHOR(S) E-MAIL: kapteyn@bio.uva.nl  
CORPORATE SOURCE: Univ Amsterdam, Swammerdam Inst Life Sci, Kruislaan  
318/NL-1098 SM Amsterdam//Netherlands/ (REPRINT); Univ Amsterdam,  
Swammerdam Inst Life Sci, /NL-1098 SM Amsterdam//Netherlands/; Univ  
Illinois, Dept Vet Pathobiol, /Urbana//IL/61802; Univ Utrecht, Dept Mol  
Cell Biol, /NL-3584 CH Utrecht//Netherlands/; Univ Helsinki, Inst  
Biotechnol, /Helsinki//Finland/; Univ Kuopio, Dept Biochem & Biotechnol,  
/FIN-70211 Kuopio//Finland/  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: MOLECULAR MICROBIOLOGY, 2000, V35, N3 (FEB), P601-611  
GENUINE ARTICLE#: 285BF  
PUBLISHER: BLACKWELL SCIENCE LTD, P O BOX 88, OSNEY MEAD, OXFORD OX2 0NE,  
OXON, ENGLAND  
ISSN: 0950-382X  
LANGUAGE: English DOCUMENT TYPE: ARTICLE  
ABSTRACT: In *\*Candida\*\*\* \*albicans\*\*\** wild-type cells, the beta

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1,6-glucanase-extractable glycosylphosphatidylinositol (GPI) dependent cell wall proteins (CWP<sub>s</sub>) account for about 88% of all covalently linked CWP<sub>s</sub>. Approximately 90% of these GPI-CWP<sub>s</sub>, including \*Als1p"\*\* and Als3p, are attached via beta 1,6-glucan to beta 1,3-glucan. The remaining GPI-CWP<sub>s</sub> are linked through beta 1,6-glucan to chitin. The beta 1,6-glucanase-resistant protein fraction is small and consists of Pir-related CWP<sub>s</sub>, which are attached to beta 1,3-glucan through an alkali-labile linkage. Immunogold labelling and Western analysis, using an antiserum directed against *Saccharomyces cerevisiae* Pir2p/Hsp150, point to the localization of at least two differentially expressed Pir2 homologues in the cell wall of *C. albicans*"\*\*. In mnn9 Delta and pmt1 Delta mutant strains, which are defective in N- and O-glycosylation of proteins respectively, we observed enhanced chitin levels together with an increased coupling of GPI-CWP<sub>s</sub> through beta 1,6-glucan to chitin. In these cells, the level of Pir-CWP<sub>s</sub> was slightly upregulated. A slightly increased incorporation of Pir proteins was also observed in a beta 1,6-glucan-deficient hemizygous kre6 Delta mutant. Taken together, these observations show that *C. albicans*"\*\* follows the same basic rules as *S. cerevisiae* in constructing a cell wall and indicate that a cell wall salvage mechanism is activated when \*Candida"\*\* cells are confronted with cell wall weakening.

3/3,AB/16 (Item 9 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
(c) 2002 Inst for Sci Info. All rts. reserv.

09909577 References: 56  
TITLE: Identification of \*Candida"\*\* \*albicans"\*\* ALS2 and ALS4 and localization of ALS proteins to the fungal cell surface  
AUTHOR(S): Hoyer LL (REPRINT); Payne TL; Hecht JE  
CORPORATE SOURCE: UNIV ILLINOIS,DEPT VET PATHOBIOLOGY, 2522 VMBSB, 2001 LINCOLN AVE/URBANA//IL/61802 (REPRINT)  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: JOURNAL OF BACTERIOLOGY, 1998, V180, N20 (OCT), P5334-5343  
GENUINE ARTICLE#: 127JD  
PUBLISHER: AMER SOC MICROBIOLOGY, 1325 MASSACHUSETTS AVENUE, NW,  
WASHINGTON, DC 20005-4171  
ISSN: 0021-9193  
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: Additional genes in the growing ALS family of \*Candida"\*\* \*albicans"\*\* were isolated by PCR screening of a genomic fosmid library with primers designed from the consensus tandem-repeat sequence of \*ALS1"\*\*. This procedure yielded fosmids encoding ALS2 and ALS4. ALS2 and ALS4 conformed to the three-domain structure of ALS genes, which consists of a central domain of tandemly repeated copies of a 108-bp motif, an upstream domain of highly conserved sequences, and a domain of divergent sequences 3' of the tandem repeats. Alignment of five predicted Als protein sequences indicated conservation of N- and C-terminal hydrophobic regions which have the hallmarks of secretory signal sequences and glycosylphosphatidylinositol addition sites, respectively. Heterologous expression of an N-terminal fragment of \*Als1p"\*\* in *Saccharomyces cerevisiae* demonstrated function of the putative signal sequence with cleavage following Ala17. This signal sequence cleavage site was conserved in the four other Als proteins analyzed, suggesting identical processing of each protein. Primary-structure features of the five Als proteins suggested a cell-surface localization, which was confirmed by indirect immunofluorescence with an anti-Als antiserum. Staining was observed on

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mother yeasts and germ tubes, although the intensity of staining on the mother yeast decreased with elongation of the germ tube. Similar to other ALS genes, ALS2 and ALS4 were differentially regulated. ALS4 expression was correlated with the growth phase of the culture; ALS2 expression was not observed under many different in vitro growth conditions. The data presented here demonstrate that ALS genes encode cell-surface proteins and support the conclusion that the size and number of Als proteins on the *C. albicans*"\*\* cell surface vary with strain and growth conditions.

3/3,AB/17 (Item 10 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
(c) 2002 Inst for Sci Info. All rts. reserv.

09757744 References: 56  
TITLE: Multiple functions of Pmtlp-mediated protein O-mannosylation in the fungal pathogen *\*Candida\*\*\* \*albicans\*\*\**  
AUTHOR(S): Timpel C; StrahlBolsinger S; Ziegelbauer K; Ernst JF (REPRINT)  
CORPORATE SOURCE: UNIV DUSSELDORF, INST MIKROBIOL, UNIV STR 1-26-12/D-40225  
DUSSELDORF//GERMANY/ (REPRINT); UNIV DUSSELDORF, INST MIKROBIOL/D-40225  
DUSSELDORF//GERMANY/; UNIV DUSSELDORF, BIOL MED FORSCHUNGSZENTRUM/D-40225  
DUSSELDORF//GERMANY/; UNIV REGENSBURG, LEHRSTUHL ZELLBIOL &  
PFLANZENPHYSIOL/D-93040 REGENSBURG//GERMANY/; BAYER AG,LEHRSTUHL ZELLBIOL  
& PFLANZENPHYSIOL/D-42117 WUPPERTAL//GERMANY/  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: JOURNAL OF BIOLOGICAL CHEMISTRY, 1998, V273, N33 (AUG 14), P  
20837-20846  
GENUINE ARTICLE#: 110MZ  
PUBLISHER: AMER SOC BIOCHEMISTRY MOLECULAR BIOLOGY INC, 9650 ROCKVILLE  
PIKE, BETHESDA, MD 20814  
ISSN: 0021-9258  
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: Protein mannosylation by Pmt proteins initiates O-glycosylation in fungi. We have identified the PMT1 gene and analyzed the function of Pmtlp in the fungal human pathogen *\*Candida\*\*\* \*albicans\*\*\**. Mutants defective in PMT1 alleles lacked Pmt in vitro enzymatic activity, showed reduced growth rates, and tended to form cellular aggregates. In addition, multiple specific deficiencies not known in *Saccharomyces cerevisiae* (including defective hyphal morphogenesis; supersensitivity to the antifungal agents hygromycin B, G418, clotrimazole, and calcofluor white; and reduced adherence to Caco-2 epithelial cells) were observed in pmt1 mutants. PMT1 deficiency also led to faster electrophoretic mobility of the *\*Als1p\*\*\** cell wall protein and to elevated extracellular activities of chitinase. Homozygous pmt1 mutants were avirulent in a mouse model of systemic infection, while heterozygous PMT1/pmt1 strains showed reduced virulence. The results indicate that protein O-mannosylation by Pmt proteins occurs in different fungal species, where PMT1 deficiency can lead to defects in multiple cellular functions.

3/3,AB/18 (Item 11 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
(c) 2002 Inst for Sci Info. All rts. reserv.

09674219 References: 39  
TITLE: *\*Candida\*\*\* \*albicans\*\*\** ALS3 and insights into the nature of the ALS gene family

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AUTHOR(S): Hoyer LL (REPRINT); Payne TL; Bell M; Myers AM; Scherer S  
CORPORATE SOURCE: UNIV ILLINOIS, DEPT VET PATHOBIOL, 2522 VMBSB, 2001 S  
LINCOLN AVE/URBANA//IL/61802 (REPRINT); IOWA STATE UNIV SCI &  
TECHNOL, DEPT BIOCHEM & BIOPHYS/AMES//IA/50011; UNIV CALIF  
BERKELEY, LAWRENCE BERKELEY LAB, HUMAN GENOME CTR/BERKELEY//CA/94720; UNIV  
MINNESOTA, DEPT MICROBIOL/MINNEAPOLIS//MN/55455  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: CURRENT GENETICS, 1998, V33, N6 (JUN), P451-459  
GENUINE ARTICLE#: 101RU  
PUBLISHER: SPRINGER VERLAG, 175 FIFTH AVE, NEW YORK, NY 10010  
ISSN: 0172-8083  
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: The \*ALS1\*\*\* (\*agglutinin\*\*\*-like\*\*\* sequence) gene of \*Candida\*\*\* \*albicans\*\*\* encodes a protein similar to alpha-agglutinin, a cell-surface adhesion glycoprotein of *Saccharomyces cerevisiae* (Hoyer et al. 1995). A central domain of a tandemly repeated 108-bp sequence is found in the \*ALS1\*\*\* coding region. This tandem-repeat motif hybridizes to multiple *C. albicans* genomic DNA fragments, indicating the possibility of other \*ALS1\*\*\*-like genes in *C. albicans* (Hoyer et al. 1995). To determine if these fragments constitute a gene family, tandem-repeat-hybridizing genomic fragments were isolated from a fosmid library by PCR screening using primers based on the consensus tandem-repeat sequence of \*ALS1\*\*\* (Hoyer et al. 1995). One group of fosmids, designated ALS3, encodes a gene with 81% identity to \*ALS1\*\*\*. The sequences of \*ALS1\*\*\* and ALS3 are most conserved in the tandem-repeat domain and in the region 5' of the tandem repeats. Northern-blot analysis using unique probes from the 3' end of each gene demonstrated that \*ALS1\*\*\* expression varies, depending on which *C. albicans* strain is examined, and that, ALS3 is hyphal-specific. Both genes are found in a variety of *C. albicans* and *C. stellatoidea* strains examined. The predicted Als1p\*\*\* and Als3p exhibit features suggesting that both are cell-surface glycoproteins. Southern blots probed with conserved sequences from the region 5' of the tandem repeats suggest that other ALS-like sequences are present in the *C. albicans* genome and that the ALS family may be larger than originally estimated.

3/3, AB/19 (Item 12 from file: 440)  
DIALOG(R) File 440: Current Contents Search(R)  
(c) 2002 Inst for Sci Info. All rts. reserv.

09327986 References: 13  
TITLE: Expression of the \*Candida\*\*\* \*albicans\*\*\* gene \*ALS1\*\*\* in *Saccharomyces cerevisiae* induces adherence to endothelial and epithelial cells  
AUTHOR(S): Fu Y; Rieg G; Fonzi WA; Belanger PH; Edwards JE; Filler SG (REPRINT)  
CORPORATE SOURCE: UNIV CALIF LOS ANGELES, HARBOR RES & EDUC INST, ST, DIV INFECT DIS, DEPT MED/TORRANCE//CA/90502 (REPRINT); UNIV CALIF LOS ANGELES, HARBOR RES & EDUC INST, ST, DIV INFECT DIS, DEPT MED/TORRANCE//CA/90502; GEORGETOWN UNIV, DEPT MICROBIOL & IMMUNOL/WASHINGTON//DC/20007; UNIV CALIF LOS ANGELES, SCH MED/LOS ANGELES//CA/90024  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: INFECTION AND IMMUNITY, 1998, V66, N4 (APR), P1783-1786  
GENUINE ARTICLE#: ZD630  
PUBLISHER: AMER SOC MICROBIOLOGY, 1325 MASSACHUSETTS AVENUE, NW,

09/715876

WASHINGTON, DC 20005-4171

ISSN: 0019-9567

LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: To identify genes encoding adhesins that mediate the binding of *\*Candida\*\*\* \*albicans\*\*\** to endothelial cells, a genomic library from this organism was constructed and used to transform *Saccharomyces cerevisiae*. These transformed organisms were screened for adherence to endothelial cells, and a highly adherent clone was identified. The adherence of this clone to endothelial cells was over 100-fold greater than that of control *S. cerevisiae* transformed with the empty plasmid. This clone also exhibited enhanced adherence to epithelial cells. The *C. \*albicans\*\*\** gene contained within this clone was found to be *\*ALS1\*\*\**. These results indicate that *\*ALS1\*\*\** may encode a candidal adhesin.

3/3,AB/20 (Item 13 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
(c) 2002 Inst for Sci Info. All rts. reserv.

06044548 References: 54

TITLE: *\*CANDIDA\*\*\* \*ALBICANS\*\*\* \*ALS1\*\*\* - DOMAINS RELATED TO A SACCHAROMYCES CEREVIAE SEXUAL AGGLUTININ SEPARATED BY A REPEATING MOTIF*

AUTHOR(S): HOYER LL; SCHERER S; SHATZMAN AR; LIVI GP

CORPORATE SOURCE: IOWA STATE UNIV SCI & TECHNOL,DEPT BIOCHEM & BIOPHYS/AMES//IA/50011 (Reprint); UNIV CALIF BERKELEY, LAWRENCE BERKELEY LAB,CTR HUMAN GENOME/BERKELEY//CA/94720; SMITHKLINE BEECHAM PHARMACEUT,DEPT GENE EXPRESSSCI/KING OF PRUSSIA//PA/19406

PUBLICATION: MOLECULAR MICROBIOLOGY, 1995, V15, N1 (JAN), P39-54

GENUINE ARTICLE#: PZ351

ISSN: 0950-382X

LANGUAGE: ENGLISH DOCUMENT TYPE: ARTICLE

ABSTRACT: Transfer of budding *\*Candida\*\*\* \*albicans\*\*\** yeast cells from the rich, complex medium YEPD to the defined tissue culture medium RPMI 1640 (RPMI) at 37 degrees C and 5% CO<sub>2</sub> causes rapid onset of hyphal induction. Among the genes induced under these conditions are hyphal-specific genes as well as genes expressed in response to changes in temperature, CO<sub>2</sub> and specific media components. A cDNA library constructed from cells incubated for 20 min in RPMI was differentially screened with yeast (YEPD)- and hyphal (RPMI)-specific probes resulting in identification of a gene expressed in response to culture conditions but not regulated by the yeast-hyphal transition. The deduced gene product displays significant identity to *Saccharomyces cerevisiae* a-agglutinin, encoded by AG alpha 1, an adhesion glycoprotein that mediates mating of haploid cells. The presence of this gene in *C. \*albicans\*\*\** is curious since the organism has not been observed to undergo meiosis. We designate the *C. \*albicans\*\*\** gene *\*ALS1\*\*\** (for *\*agglutinin\*\*\*-like\*\*\** sequence). While the N- and C-termini of the predicted 1260-amino-acid *\*ALS1\*\*\** protein resemble those of the 650-amino-acid AG alpha 1, *\*ALS1\*\*\** contains a central domain of tandem repeats consisting of a highly conserved 36-amino-acid sequence not present in AG alpha 1. These repeats are also present on the nucleotide level as a highly conserved 108 bp motif. Southern and Northern blot analyses indicate a family of *C. \*albicans\*\*\** genes that contain the tandem repeat motif; at least one gene in addition to *\*ALS1\*\*\** is expressed under conditions similar to those for *\*ALS1\*\*\** expression. Genomic Southern blots from several *C. \*albicans\*\*\** isolates indicate that the number of copies of

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the tandem repeat element in \*ALS1\*\*\* differs across strains and, in some cases, between \*ALS1\*\*\* alleles in the same strain, suggesting a strain-dependent variability in \*ALS1\*\*\* protein size. Potential roles for the \*ALS1\*\*\* protein are discussed.

3/3,AB/21 (Item 1 from file: 348)  
DIALOG(R)File 348:EUROPEAN PATENTS  
(c) 2002 European Patent Office. All rts. reserv.

01086530  
Process for detecting primary signals of cell communication between cells of the immune system  
Verfahren zum Erfassen von Primarsignalen bei der Zellkommunikation von Zellen des Immunsystems  
Procede de detection de signaux primaires de communication cellulaire entre cellules du système immunitaire

PATENT ASSIGNEE:  
Holzel Diagnostika Handels GmbH, (2504010), Gereonswall 136, 50670 Köln, (DE), (Applicant designated States: all)

INVENTOR:  
Holzel, Veit, Namibiastrasse 24, 50733 Köln, (DE)

LEGAL REPRESENTATIVE:  
Patentanwalte Sternagel & Fleischer (101441), Braunsberger Feld 29, 51429 Bergisch Gladbach, (DE)

PATENT (CC, No, Kind, Date): EP 955544 A1 991110 (Basic)

APPLICATION (CC, No, Date): EP 98108220 980506;

DESIGNATED STATES: DE

EXTENDED DESIGNATED STATES: AL; LT; LV; MK; RO; SI

INTERNATIONAL PATENT CLASS: G01N-033/53

ABSTRACT EP 955544 A1 (Translated)

Detection of primary signals in immune cell communication useful for monitoring effects on immune system

A process for detecting primary cell signals in human or mammal cell communication in vitro, comprises:

(a) incubating the cells with polymer beads with diameter 5-100 µm, which have been coated with at least one antibody, which is specific for these primary signals, under physiological conditions;

(b) exposing the cells to a stimulating factor, which causes the cells to release their primary signals, which then bind to the specific antibodies; and

(c) detecting the bound primary signals using labelled antibodies.

TRANSLATED ABSTRACT WORD COUNT: 96

ABSTRACT EP 955544 A1

Die Erfindung betrifft ein Verfahren zum Erfassen von Primarsignalen der Zellkommunikation von menschlichen und Säugetierzellen auserhalb eines Organismus, wobei Polymerkugelchen mit einem Durchmesser von 5 bis 100 (µm). die mindestens mit einem für diese Primarsignale spezifischen Antikörper beladen sind, mit menschlichen oder Säugetierzellen, die Primarsignale aussenden können, gemischt und in Zellkultur unter physiologischen Bedingungen inkubiert werden, worin die Zellen durch einen externen Reiz zur Abgabe des Primarsignals stimuliert werden und die Polymerkugelchen die abgegebenen Primarsignale auffangen, welche anschließend mit Hilfe eines weiteren Antikörpers, an den ein die Detektion zulassendes Molekül gekoppelt ist, mesbar gemacht werden.

ABSTRACT WORD COUNT: 96

09/715876

LANGUAGE (Publication, Procedural, Application): German; German; German  
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(German)	9945	372
SPEC A	(German)	9945	5599
Total word count - document A			5971
Total word count - document B			0
Total word count - documents A + B			5971

3/3,AB/22 (Item 2 from file: 348)  
DIALOG(R)File 348:EUROPEAN PATENTS  
(c) 2002 European Patent Office. All rts. reserv.

00623907

Immunoassay

Immunologischer Test

Essai immunologique

PATENT ASSIGNEE:

SEROSEARCH GmbH - ENTWICKLUNG UND KONZEPTION LABORDIAGNOSTISCHE PRODUKTE  
BERGHAUSEN, (1740760), Martin-Luther-Strasse 5, D-76327 Pfinztal, (DE),  
(applicant designated states: DE;FR;IT)

INVENTOR:

Naser, Karin, Dipl.-Biol., Lindpaintnerstrasse 85, D-70195 Stuttgart,  
(DE)

PATENT (CC, No, Kind, Date): EP 608791 A2 940803 (Basic)  
EP 608791 A3 950712  
EP 608791 B1 970709

APPLICATION (CC, No, Date): EP 94100924 940122;

PRIORITY (CC, No, Date): DE 4302012 930126

DESIGNATED STATES: DE; FR; IT

INTERNATIONAL PATENT CLASS: G01N-033/543; G01N-033/547; G01N-033/551;  
G01N-033/554;

ABSTRACT EP 608791 A2 (Translated)

The present invention relates to a method for the diagnostic determination of immunologically active material based on an agglutination reaction, its use and the articles needed therefor.

TRANSLATED ABSTRACT WORD COUNT: 29

ABSTRACT EP 608791 A2

Die vorliegende Erfindung betrifft ein Verfahren zur diagnostischen Bestimmung von immunologisch aktiven Material auf Basis einer Agglutinationsreaktion, deren Anwendung und die dafur benötigten Gegenstände.

ABSTRACT WORD COUNT: 26

LANGUAGE (Publication, Procedural, Application): German; German; German  
FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(German)	EPABF2	811
CLAIMS B	(English)	EPAB97	937
CLAIMS B	(German)	EPAB97	841
CLAIMS B	(French)	EPAB97	1028
SPEC A	(German)	EPABF2	6957
SPEC B	(German)	EPAB97	6874
Total word count - document A			7770
Total word count - document B			9680

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Total word count - documents A + B 17450

3/3,AB/23 (Item 3 from file: 348)  
DIALOG(R)File 348:EUROPEAN PATENTS  
(c) 2002 European Patent Office. All rts. reserv.

00465029

Filamentous hemagglutinin of bordetella pertussis as a carrier molecule for conjugate vaccines.  
Faser-\*Hemagglutinin"\*\* von Bordetella pertussis \*als"\*\* Trager fur konjugierten Impfstoff.  
Hemagglutinine filamenteuse de Bordetella pertussis a titre de molecules porteuses pour vaccins conjugues.

PATENT ASSIGNEE:

AMERICAN CYANAMID COMPANY, (212594), One Cyanamid Plaza, Wayne, NJ  
07470-8426, (US), (applicant designated states:  
AT;BE;CH;DE;DK;ES;FR;GB;GR;IT;LI;NL;SE)

INVENTOR:

Kimura, Alan, 9856 N.W. 52 Terrace, Miami, FL 33178, (US)  
Dick, William Edwin JR., 754 Hawthorne Place, Webster, NY, (US)  
Cowell, James Leo, 37 Sugarmills Circle, Fairport, NY 14450, (US)

LEGAL REPRESENTATIVE:

Wachtershauser, Gunter, Prof. Dr. (12711), Patentanwalt, Tal 29, D-80331  
Munchen, (DE)

PATENT (CC, No, Kind, Date): EP 471177 A2 920219 (Basic)  
EP 471177 A3 930224  
EP 471177 B1 951004

APPLICATION (CC, No, Date): EP 91110919 910702;

PRIORITY (CC, No, Date): US 565161 900813

DESIGNATED STATES: AT; BE; CH; DE; DK; ES; FR; GB; GR; IT; LI; NL; SE

INTERNATIONAL PATENT CLASS: A61K-039/10; A61K-039/385;

ABSTRACT EP 471177 A2

This invention pertains to immunogenic conjugates comprising an antigen bound to a filamentous hemagglutinin of Bordetella pertussis and a method of eliciting an immune response against an antigen comprising administering such an immunogenic conjugate with a pharmaceutically acceptable vehicle to a vertebrate host.

ABSTRACT WORD COUNT: 45

LANGUAGE (Publication, Procedural, Application): English; English; English

FULLTEXT AVAILABILITY:

Available Text	Language	Update	Word Count
CLAIMS A	(English)	EPABF1	232
CLAIMS B	(English)	EPAB95	232
CLAIMS B	(German)	EPAB95	248
CLAIMS B	(French)	EPAB95	257
SPEC A	(English)	EPABF1	2515
SPEC B	(English)	EPAB95	2436
Total word count - document A			2747
Total word count - document B			3173
Total word count - documents A + B			5920

3/3,AB/24 (Item 4 from file: 348)  
DIALOG(R)File 348:EUROPEAN PATENTS  
(c) 2002 European Patent Office. All rts. reserv.

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00301729

Medicament containing a polysaccharidic component from thuja plants as the active ingredient.

Arzneimittel mit einem Gehalt an einer Polysaccharide enthaltenden Komponente aus Thujapflanzen als aktivem Wirkstoff.

Medicament contenant comme agent actif un composant polysaccharidique de plantes de thuja.

PATENT ASSIGNEE:

Neth, Rolf Dietmar, Prof. Dr., (1033840), Pennskuhle 9, W-2110 Buchholz, (DE), (applicant designated states:

AT;BE;CH;DE;ES;FR;GB;GR;IT;LI;LU;NL;SE)

STIFTUNG ZUR FORDERUNG DER ERFAHRUNGSHEILKUNDE IM STIFTERVERBAND FÜR DIE DEUTSCHE WISSENSCHAFT, (1033850), Brucker Holt 56-60, W-4300 Essen 1, (DE), (applicant designated states:

AT;BE;CH;DE;ES;FR;GB;GR;IT;LI;LU;NL;SE)

INVENTOR:

Gohla, Sven, Waitzstrasse 17, W-2000 Hamburg 52, (DE)

Neth, Rolf Dietmar, Prof. Dr., Pennskuhle 9, W-2110 Buchholz, (DE)

Haubeck, Hans-Dieter, Dr., Veghestrasse 10, W-4400 Munster/Westf., (DE)

LEGAL REPRESENTATIVE:

UEXKULL & STOLBERG Patentanwalte (100011), Beselerstrasse 4, W-2000 Hamburg 52, (DE)

PATENT (CC, No, Kind, Date): EP 315182 A2 890510 (Basic)

EP 315182 A3 890628

EP 315182 B1 911127

APPLICATION (CC, No, Date): EP 88118394 881104;

PRIORITY (CC, No, Date): DE 3738319 871106; DE 3822945 880707

DESIGNATED STATES: AT; BE; CH; DE; ES; FR; GB; GR; IT; LI; LU; NL; SE

INTERNATIONAL PATENT CLASS: A61K-031/715; A61K-035/78;

ABSTRACT EP 315182 A2 (Translated)

The plant component achieves a specific induction of the lymphocytic T-helper cell fraction of the peripheral blood. The specific induction of the fraction of T-helper cells is associated with the expression of the T-helper cell activation markers OKT 17 and OKT 26a and with an increased interleukin-2 synthesis.

The component furthermore stimulates leukocyte formation and has a protective effect against stress due to radioactive emissions.

TRANSLATED ABSTRACT WORD COUNT: 67

ABSTRACT EP 315182 A2

Es werden Arzneimittel mit einer aus Thujapflanzen gewonnenen Polysaccharide enthaltende Komponente als aktivem Wirkstoff beschrieben.

Mit der pflanzlichen Komponente wird eine spezifische Induktion der lymphozytären T-Helferzellfraktion des peripheren Blutes erzielt. Die spezifische Induktion der Fraktion der T-Helferzellen ist verbunden mit der Expression der T-Helferzellaktivierungsmarker Okt 17 und Okt 26a sowie einer erhöhten Interleukin-2 Synthese.

Die erfindungsgemäße Komponente stimuliert ferner die Leukozytenbildung und übt eine protektive Wirkung gegenüber Belastungen durch radioaktive Strahlen aus.

ABSTRACT WORD COUNT: 76

LANGUAGE (Publication, Procedural, Application): German; German; German

FULLTEXT AVAILABILITY:

Available Text Language Update Word Count

CLAIMS B (English) EPBBF1 443

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CLAIMS B	(German)	EPBBF1	375
CLAIMS B	(French)	EPBBF1	468
SPEC B	(German)	EPBBF1	4001
Total word count - document A			0
Total word count - document B			5287
Total word count - documents A + B			5287

Set	Items	Description
S4	7686	AU=(EDWARDS, J? OR EDWARDS J?)
S5	178	AU=(FILER S? OR FILER, S? OR FILLER, S? OR FILLER S?)
S6	741	AU=(CUTLER, J? OR CUTLER J?)
S7	726	AU=(SHEPPARD, D? OR SHEPPARD D?)
S8	1941	AU=(IBRAHIM, A? OR IBRAHIM A?)
S9	3493	AU=(FU, Y? OR FU Y?)
S10	2	S4 AND S5 AND S6 AND S7 AND S8 AND S9
S11	112	S4 AND (S5 OR S6 OR S7 OR S8 OR S9)
S12	36	S5 AND (S6 OR S7 OR S8 OR S9)
S13	4	S6 AND (S7 OR S8 OR S9)
S14	3	S7 AND (S8 OR S9)
S15	19	S8 AND S9
S16	13	(S5 OR S6 OR S7 OR S8 OR S9 OR S11 OR S4) AND S1
S17	47	(S10 OR S12 OR S13 OR S14 OR S15 OR S16) NOT S2
S18	16	RD (unique items)

>>>No matching display code(s) found in file(s): 65, 113

- Author(s)

18/3,AB/1 (Item 1 from file: 144)  
DIALOG(R)File 144:Pascal  
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14170743 PASCAL No.: 99-0369085  
Unanticipated heterogeneity in growth rate and virulence among *Candida albicans* AAf1 null mutants

RIEG G; YUE FU; \*IBRAHIM A S"\*\*; XIANG ZHOU; \*FILLER S G"\*\*; EDWARDS J E  
JR

Division of Infectious Diseases, St. John's Cardiovascular Research Center, Department of Medicine, Harbor-UCLA Research and Education Institute, Torrance, California 90502, United States; UCLA School of Medicine, Los Angeles, California 90024, United States

Journal: Infection and immunity, 1999, 67 (7) 3193-3198

Language: English

The disruption of a specific gene in *Candida albicans* is commonly used to determine the function of the gene product. We disrupted AAf1, a gene of *C. albicans* that causes *Saccharomyces cerevisiae* to flocculate and adhere to endothelial cells. We then characterized multiple heterozygous and homozygous mutants. These null mutants adhered to endothelial cells to the same extent as did the parent organism. However, mutants with presumably the same genotype revealed significant heterogeneity in their growth rates in vitro. This heterogeneity was not the result of the transformation procedure per se, nor was it caused by differences in the expression or function of URA3, a marker used in the process of gene disruption. The growth rate among the different heterozygous and homozygous null mutants was positively correlated with in vivo virulence in mice. It is possible that the variable phenotypes of *C. albicans* were due to mutations outside of the AAf1 coding region that were introduced during the gene disruption process. These results indicate that careful phenotypic characterization of mutants of *C. albicans* generated through targeted gene disruption should be performed to exclude the introduction of unexpected mutations that may influence pathogenicity in mice.

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18/3,AB/2 (Item 2 from file: 144)  
DIALOG(R)File 144:Pascal  
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13827102 PASCAL No.: 99-0002581  
Mechanism of fluconazole resistance in *Candida krusei*  
OROZCO A S; HIGGINBOTHAM L M; HITCHCOCK C A; PARKINSON T; FALCONER D;  
\*IBRAHIM A S\*\*\*; GHANNOUM M A; \*FILLER S G\*\*\*  
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Diseases, Harbor-UCLA Research and Education Institute, Torrance,  
California 90502, United States; Pfizer Central Research, Sandwich, Kent,  
United Kingdom; UCLA School of Medicine, Los Angeles, California 90024,  
United States

Journal: Antimicrobial agents and chemotherapy, 1998, 42 (10) 2645-2649  
Language: English

The mechanisms of fluconazole resistance in three clinical isolates of *Candida krusei* were investigated. Analysis of sterols of organisms grown in the absence and presence of fluconazole demonstrated that the predominant sterol of *C. krusei* is ergosterol and that fluconazole inhibits 14 alpha -demethylase in this organism. The 14 alpha -demethylase activity in cell extracts of *C. krusei* was 16- to 46-fold more resistant to inhibition by fluconazole than was 14 alpha -demethylase activity in cell extracts of two fluconazole-susceptible strains of *Candida albicans*. Comparing the carbon monoxide difference spectra of microsomes from *C. krusei* with those of microsomes from *C. albicans* indicated that the total cytochrome P-450 content of *C. krusei* is similar to that of *C. albicans*. The Soret absorption maximum in these spectra was located at 448 nm for *C. krusei* and at 450 nm for *C. albicans*. Finally, the fluconazole accumulation of two of the *C. krusei* isolates was similar to if not greater than that of *C. albicans*. Thus, there are significant qualitative differences between the 14 alpha -demethylase of *C. albicans* and *C. krusei*. In addition, fluconazole resistance in these strains of *C. krusei* appears to be mediated predominantly by a reduced susceptibility of 14 alpha -demethylase to inhibition by this drug.

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18/3,AB/3 (Item 3 from file: 144)  
DIALOG(R)File 144:Pascal  
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13660087 PASCAL No.: 98-0367399  
Secreted aspartyl proteinases and interactions of *Candida albicans* with  
human endothelial cells  
\*IBRAHIM A S\*\*\*; \*FILLER S G\*\*\*; SANGLARD D; EDWARDS J E JR; HUBE B  
Division of Infectious Diseases, St. John's Cardiovascular Research  
Center, Department of Medicine, Harbor-UCLA Research and Education  
Institute, Torrance, California 90509, United States; UCLA School of  
Medicine, Los Angeles, California 90024, United States; Institut de  
Microbiologie, Centre Hospitalier Universitaire Vaudois, 1011 Lausanne,  
Switzerland; Institut fuer Allgemeine Botanik, AMP III, Universitaet  
Hamburg, 22609 Hamburg, Germany

Journal: Infection and immunity, 1998, 66 (6) 3003-3005

09/715876

Language: English

The endothelial cell interactions of homozygous null mutants of *Candida albicans* that were deficient in secreted aspartyl proteinase 1 (Sap1), Sap2, or Sap3 were investigated. Only Sap2 was found to contribute to the ability of *C. albicans* to damage endothelial cells and stimulate them to express E-selectin. None of the Saps studied appears to play a role in *C. albicans* adherence to endothelial cells.

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18/3,AB/4 (Item 4 from file: 144)  
DIALOG(R)File 144:Pascal  
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13587939 PASCAL No.: 98-0291844

Cloning and characterization of CAD1/AAF1, a gene from *Candida albicans* that induces adherence to endothelial cells after expression in *Saccharomyces cerevisiae*

YUE FU; \*FILLER S G\*\*\*; SPELLBERG B J; FONZI W; \*IBRAHIM A S\*\*\*; KANBE T; GHANNOUM M A; EDWARDS J E JR

St. John Cardiovascular Research Center, Division of Infectious Diseases, Department of Medicine, Harbor-UCLA Research and Education Institute, Torrance California 90502, United States; Department of Microbiology and Immunology, Georgetown University, Washington, DC 20007, United States; School of Medicine, University of California Los Angeles, Los Angeles, California 90024, United States; Laboratory of Medical Mycology, Research Institute for Disease Mechanisms and Control, Nagoya University School of Medicine, Nagoya 466, Japan

Journal: Infection and immunity, 1998, 66 (5) 2078-2084

Language: English

Adherence to the endothelial cell lining of the vasculature is probably a critical step in the egress of *Candida albicans* from the intravascular compartment. To identify potential adhesins that mediate the attachment of this organism to endothelial cells, a genomic library from *C. albicans* was used to transform a nonadherent strain of *Saccharomyces cerevisiae*. The population of transformed yeasts was enriched for highly adherent clones by repeated passages over endothelial cells. One clone which exhibited a fivefold increase in endothelial cell adherence, compared with *S. cerevisiae* transformed with vector alone, was identified. This organism also flocculated. The candidal DNA fragment within this adherent/flocculent organism was found to contain a single 1.8-kb open reading frame, which was designated CAD1. It was found to be identical to AAF1. The predicted protein encoded by CAD1/AAF1 contained features suggestive of a regulatory factor. Consistent with this finding, immunoelectron microscopy revealed that CAD1/AAF1 localized to the cytoplasm and nucleus but not the cell wall or plasma membrane of the transformed yeasts. Because yeasts transformed with CAD1/AAF1 both flocculated and exhibited increased endothelial cell adherence, the relationship between adherence and flocculation was examined. *S. cerevisiae* expressing either of two flocculation phenotypes, Flol or NewFlo, adhered to endothelial cells as avidly as did yeasts expressing CAD1/AAF1. Inhibition studies revealed that the flocculation phenotype induced by CAD1/AAF1 was similar to Flol. Thus, CAD1/AAF1 probably encodes a regulatory protein that stimulates endothelial cell adherence in *S. cerevisiae* by inducing a flocculation phenotype. Whether CAD1/AAF1 contributes to the adherence of *C. albicans* to endothelial cells remains to be determined.

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18/3,AB/5 (Item 5 from file: 144)  
DIALOG(R)File 144:Pascal  
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12898617 PASCAL No.: 97-0164050  
Cloning and characterization of a gene (LIP1) which encodes a lipase from  
the pathogenic yeast Candida albicans : Candida albicans  
\*FU Y\*\*\*; \*IBRAHIM A S\*\*\*; FONZI W; ZHOU X; RAMOS C F; GHANNOUM M A  
Division of Infectious Diseases, St John's Cardiovascular Research  
Center, Department of Medicine, Harbour-UCLA Medical Center, Torrance, CA  
90509, United States; Department of Microbiology and Immunology, School of  
Medicine, Georgetown University Medical Center, Washington, DC 20007-2197,  
United States; University Center for Medical Mycology, Department of  
Dermatology, Case Western Reserve University and University Hospitals of  
Cleveland, 11100 Euclid Avenue, Stop LKS 5028, Cleveland, OH 44106-5028,  
United States; Mycology Reference Laboratory, Department of Dermatology,  
Case Western Reserve University and University Hospitals of Cleveland,  
11100 Euclid Avenue, Stop LKS 5028, Cleveland, OH 44106-5028, United States  
Journal: Microbiology : (Reading), 1997, 143 (p.2) 331-340

Language: English

Extracellular phospholipases are demonstrated virulence factors for a  
number of pathogenic microbes. The opportunistic pathogen Candida albicans  
is known to secrete phospholipases and these have been correlated with  
strain virulence. In an attempt to clone C. albicans genes encoding  
secreted phospholipases, Saccharomyces cerevisiae was transformed with a C.  
albicans genomic library and screened for lipolytic activity on egg-yolk  
agar plates, a traditional screen for phospholipase activity. Two identical  
clones were obtained which exhibited lipolytic activity. Nucleotide  
sequence analysis identified an ORF encoding a protein of 351 amino acid  
residues. Although no extensive homologies were identified, the sequence  
contained the Gly-X-Ser-X-Gly motif found in prokaryotic and eukaryotic  
lipases, suggesting a similar activity for the encoded protein. Indeed,  
culture supernatants from complemented yeast cells contained abundant  
hydrolytic activity against a triglyceride substrate and had no  
phospholipase activity. The data suggest that C. albicans, in addition to  
phospholipases, also has lipases. Southern blot analyses revealed that C.  
albicans may contain a lipase gene (LIP) family, and that a lipase gene(s)  
may be present in Candida parapsilosis, Candida tropicalis and Candida  
krusei, but not in Candida pseudotropicalis, Candida glabrata or S.  
cerevisiae. Northern blot analyses showed that expression of the LIP1  
transcript, the cloned gene which encodes a lipase, was detected only when  
C. albicans was grown in media containing Tween 80, other Tweens or  
triglycerides as the sole carbon source, and not in Sabouraud Dextrose  
Broth or yeast/peptone/dextrose media. Additionally, carbohydrate  
supplementation inhibited LIP1 expression. Cloning this gene will allow the  
construction of LIP1deficient null mutants which will be critical in  
determining the role of this gene in candidal virulence.

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18/3,AB/6 (Item 6 from file: 144)  
DIALOG(R)File 144:Pascal  
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12361226 PASCAL No.: 96-0005868  
Adherence to and damage of endothelial cells by Cryptococcus neoformans

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in vitro : role of the capsule

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Journal: Infection and immunity, 1995, 63 (11) 4368-4374

Language: English

Escape from the intravascular compartment is likely a critical step in the development of hematogenously disseminated cryptococcal infections, such as meningitis. The capsule of *Cryptococcus neoformans* is considered to be a virulence factor because of its antiphagocytic properties. To further investigate the role of the capsule in escape from the intravascular compartment, we used isogenic strain pairs, an acapsular mutant, and an encapsulated clinical isolate to determine the effects of the capsule of *C. neoformans* on adherence to, phagocytosis by, and damage of endothelial cells in vitro. Acapsular *C. neoformans* adhered significantly more to endothelial cells and caused greater endothelial cell injury than did encapsulated organisms. Coating of an acapsular strain with cryptococcal glucuronoxylomannan decreased both adherence to and damage of endothelial cells by 61.7% +- 9.1% and 76.6% +- 10.2%, respectively. Transmission electron microscopy demonstrated internalization of acapsular, but not encapsulated, organisms by endothelial cells. Internalization of an acapsular strain occurred through endothelial cell phagocytosis and was inhibited by cytochalasin D. Phagocytosis required a heat-labile serum factor, probably complement. These results suggest that acapsular or poorly encapsulated *C. neoformans* may be the form(s) that escapes from the vasculature during initiation of hematogenously disseminated disease.

18/3,AB/7 (Item 7 from file: 144)

DIALOG(R)File 144:Pascal

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12112423 PASCAL No.: 95-0342677

Evidence implicating phospholipase as a virulence factor of *Candida albicans*

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Harbor-UCLA, res. education inst., div. infectious diseases, Torrance CA 90502, USA

Journal: Infection and immunity, 1995, 63 (5) 1993-1998

Language: English

Three different approaches were used to investigate the role of extracellular phospholipases in the pathogenicity of *Candida albicans*. First, we compared 11 blood isolates of this yeast with an equal number of commensal strains isolated from the oral cavities of healthy volunteers. Blood isolates produced significantly more extracellular phospholipase activity than the commensal strains did. Second, two clinical isolates of *C. albicans* that differed in their levels of virulence in a newborn mouse model were compared for their ability to secrete phospholipases. The invasive strain produced significantly more extracellular phospholipase activity than the noninvasive strain did. Third, nine blood isolates were characterized for their phospholipase and proteinase production, germ tube formation, growth, and adherence to and damage of endothelial cells in vitro. These factors were analyzed subsequently to determine whether they predicted mortality in a mouse model of hematogenously disseminated candidiasis. By proportional hazard analysis, the relative risk of death was 5.6-fold bigger (95% confidence interval, 1.672 to 18.84 (P<0.005)) in

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the mice infected with the higher-phospholipase-secreting strains than in the low-phospholipase secretors. None of the other putative virulence factors predicted mortality. Characterization of phospholipases secreted by three of the blood isolates showed that these strains secreted both phospholipase B and lysophospholipase-transacylase activities. These results implicate extracellular phospholipase as a virulence factor in the pathogenesis of hematogenous infections caused by *C. albicans*

18/3,AB/8 (Item 8 from file: 144)  
DIALOG(R)File 144:Pascal  
(c) 2002 INIST/CNRS. All rts. reserv.

11474042 PASCAL No.: 94-0311301  
Mechanisms by which *Candida albicans* induces endothelial cell prostaglandin synthesis  
\*FILLER S G\*\*\*; IBE B O; \*IBRAHIM A S\*\*\*; GHANNOUM M A; USHA RAJ J; EDWARDS J E JR  
UCLA, school medicine, div. infectious diseases, Torrance CA 90509, USA  
Journal: Infection and immunity, 1994, 62 (3) 1064-1069  
Language: English

One strategy for improving resistance to opportunistic pathogens is to determine host cellular responses during the invasion process and upregulate those responses that are relevant to host defense mechanisms. Within this context, we have shown previously that invasion of endothelial cells by *Candida albicans* in vitro causes increased production of prostaglandins. As a prerequisite for modulating endothelial cell prostaglandin production, we now characterize the mechanisms through which this process occurs. Endothelial cell invasion by *C. albicans* appeared to stimulate the conversion of arachidonic acid into prostaglandins by upregulating the synthesis of endothelial cell cyclooxygenase and increasing the activity of the endothelial cell phospholipase

18/3,AB/9 (Item 9 from file: 144)  
DIALOG(R)File 144:Pascal  
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10988500 PASCAL No.: 93-0498005  
Interferon- gamma protects endothelial cells from damage by *Candida albicans*  
\*IBRAHIM A S\*\*\*; \*FILLER S G\*\*\*; GHANNOUM M A; EDWARDS J E JR  
Harbor-UCLA medical cent., dep. internal medicine, div. infectious diseases, Torrance CA 90509, USA  
Journal: The Journal of infectious diseases, 1993, 167 (6) 1467-1470  
Language: English

Endothelial cells activated with interferon- gamma (IFN- gamma) have been shown to inhibit the replication of *Toxoplasma gondii*. To determine if this cytokine protects endothelial cells from damage by *Candida albicans*, human umbilical vein endothelial cells were pretreated with IFN- gamma and infected with *C. albicans*; endothelial cell damage was measured by the release of SUP 5 SUP 1 Cr. Pretreatment with IFN- gamma decreased the extent of endothelial cell injury caused by *C. albicans* by up to 100% +/- 8.2%. This diminution of endothelial cell damage was confirmed by scanning electron microscopy. The degree of protection was dependent on the concentration of IFN- gamma, with maximum protection occurring at 13 units/mL

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18/3,AB/10 (Item 10 from file: 144)  
DIALOG(R)File 144:Pascal  
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10501149 PASCAL No.: 93-0010400  
Modulation of interactions of Candida albicans and endothelial cells by  
fluconazole and amphotericin B  
GHANNOUM M A; \*FILLER S G\*\*\*; \*IBRAHIM A S\*\*\*; YUE FU; EDWARDS J E JR  
Harbor-univ. California, Los Angeles medical cent., div. adult infectious  
diseases, Torrance CA 90509, USA  
Journal: Antimicrobial agents and chemotherapy, 1992, 36 (10) 2239-2244  
Language: English  
Using an in vitro model of intravascular infection, we examined the  
effects of exposure to subinhibitory concentrations of fluconazole and  
amphotericin B on the ability of Candida albicans to adhere to and damage  
human umbilical vein endothelial cells. Incubation of the organisms for 18  
h in 0.5x the MICs of fluconazole and amphotericin B inhibited endothelial  
cell adherence by 22 and 91%, respectively (P<0.001 for each drug).  
Candida-induced endothelial cell injury was also decreased by exposing the  
organisms to the antifungal drugs while in contact with the endothelial  
cells

18/3,AB/11 (Item 1 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
(c) 2002 Inst for Sci Info. All rts. reserv.

12427747 References: 82  
TITLE: Pathogenesis I: interactions of host cells and fungi  
AUTHOR(S): Clemons KV (REPRINT); Calich VLG; Burger E; \*Filler SG\*\*\*;  
Graziutti M; Murphy J; Roilides E; Campa A; Dias MR; Edwards JE; \*Fu Y\*\*\*  
; Fernandes-Bordignon G; Ibrahim Z; Katsifa H; Lameignere CG;  
Meloni-Bruneri LH; Rex J; Savary CA; Xidieh C  
AUTHOR(S) E-MAIL: Karl.Clemons@slip.net  
CORPORATE SOURCE: Santa Clara Valley Med Ctr, Div Infect Dis, 751 S Bascom  
Ave/San Jose//CA/95128 (REPRINT); Santa Clara Valley Med Ctr, Div Infect  
Dis, /San Jose//CA/95128; Calif Inst Med Res, /San Jose//CA/95128;  
Stanford Univ, Div Infect Dis & Geog Med, /Stanford//CA/94305; Univ Sao  
Paulo, Dept Imunol ICB, /Sao Paulo//Brazil/; Univ Sao Paulo, Dept Anal  
Clin & Toxicol FCF, /Sao Paulo//Brazil/; Harbor UCLA Res & Educ Inst,  
Dept Med, /Torrance//CA/; Univ Calif Los Angeles, Sch Med, /Los  
Angeles//CA/; Fdn Ctr Estudios Infect, /Buenos Aires/DF/Argentina/; Univ  
Texas, Dept Surg Oncol, /Houston//TX/77030; Univ Texas, Dept Mol &  
Cellular Oncol, /Houston//TX/77030; Univ Texas, Dept Internal Med,  
/Houston//TX/; Univ Oklahoma, Dept Microbiol & Immunol, /Oklahoma  
City//OK/73190; Univ Thessaloniki, Dept Pediat 3, /GR-54006  
Salonika//Greece/  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: MEDICAL MYCOLOGY, 2000, V38, ,1, P99-111  
GENUINE ARTICLE#: 401ZE  
PUBLISHER: B I O S SCIENTIFIC PUBLISHERS LTD, 9 NEWTEC PLACE, MAGDALEN RD,  
OXFORD OX4 1RE, ENGLAND  
ISSN: 1369-3786  
LANGUAGE: English DOCUMENT TYPE: ARTICLE

ABSTRACT: The interactions of host cells and fungi during infection  
represent a complex interplay. Although T helper 1 (Th1)-mediated immunity

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is primarily responsible for acquired resistance to *Paracoccidioides brasiliensis*, studies have demonstrated that polymorphonuclear neutrophils play a critical role in providing an early resistance to this organism. One study has shown that the invasiveness of *Candida albicans* requires adherence, particularly to endothelial cells, which in turn are stimulated to express various cell-markers and pro-inflammatory cytokines as part of a proactive resistance to invasion. Somewhat in contrast to infection with *C. albicans*, it has been shown that the capsular glucuronoxylomannan of *Cryptococcus neoformans* causes the shedding of host-cell adherence molecules (L-selectins) needed for the migration of host-inflammatory cells to sites of infection and likely explains, in part, the reduced host inflammatory response to this organism. Resistance to aspergillosis is often associated with the immune status of the host. In one set of studies, it has been demonstrated that lymphocytes have little direct effect on the organism, but that antigen-presenting dendritic cells stimulate the production of Th1 cytokines, suggesting a positive role for the dendritic cell in host-response. Similarly, another study has shown that among the regulatory cytokine networks that Th2-associated cytokines (e.g., interleukin-10) likely play a detrimental role in the resistance of the host to *Aspergillus fumigatus*.

18/3,AB/12 (Item 2 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
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09896968 References: 52  
TITLE: Cloning and disruption of caPLB1, a phospholipase B gene involved in the pathogenicity of *Candida albicans*  
AUTHOR(S): Leidich SD; \*Ibrahim AS\*\*\*; \*Fu Y\*\*\*; Koul A; Jessup C; Vitullo J; Fonzi W; Mirbod F; Nakashima S; Nozawa Y; Ghannoum MA (REPRINT)  
CORPORATE SOURCE: UNIV HOSP CLEVELAND,CTR MED MYCOL, 11100 EUCLID AVE/CLEVELAND//OH/44106 (REPRINT); UNIV HOSP CLEVELAND,CTR MED MYCOL/CLEVELAND//OH/44106; CASE WESTERN RESERVE UNIV,/CLEVELAND//OH/44106 ; UNIV CALIF LOS ANGELES,HARBOR MED CTR, DEPT MED, DIV INFECT DIS, ST JOHNS CARDIOVASC RES CTR/TORRANCE//CA/90509; GEORGETOWN UNIV,MED CTR, SCH MED, DEPT MICROBIOL & IMMUNOL/WASHINGTON//DC/20007; GIFU UNIV,SCH MED, DEPT BIOCHEM/GIFU 500//JAPAN/  
PUBLICATION TYPE: JOURNAL  
PUBLICATION: JOURNAL OF BIOLOGICAL CHEMISTRY, 1998, V273, N40 (OCT 2), P 26078-26086  
GENUINE ARTICLE#: 125XU  
PUBLISHER: AMER SOC BIOCHEMISTRY MOLECULAR BIOLOGY INC, 9650 ROCKVILLE PIKE, BETHESDA, MD 20814  
ISSN: 0021-9258  
LANGUAGE: English DOCUMENT TYPE: ARTICLE  
ABSTRACT: The *Candida albicans* PLB1 gene was cloned using a polymerase chain reaction-based approach relying on degenerate oligonucleotide primers designed according to the amino acid sequences of two peptide fragments obtained from a purified candidal enzyme displaying phospholipase activity (Mirbod, F., Banno, Y., Ghannoum, M. A, Ibrahim, A. S., Nakashima, S., Yasuo, It., Cole, G. T., and Nozawa, Y. (1995) Biochim. Biophys. Acta 1257, 181-188). Sequence analysis of a 6.7-kilobase pair EcoRI-ClaI genomic clone revealed a single open reading frame of 1818 base pairs that predicts for a preprotein of 605 residues. Comparison of the putative candidal phospholipase with those of other proteins in data base revealed significant homology to known fungal phospholipase Bs from *Saccharomyces cerevisiae* (45%), *Penicillium notatum* (42%), *Torulaspora delbrueckii* (48%),

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and *Schizosaccharomyces pombe* (38%). Thus, we have cloned the gene encoding a *C. albicans* phospholipase B homolog. This gene, designated caPLB1, was mapped to chromosome 6. Disruption experiments revealed that the caplb1 null mutant is viable and displays no obvious phenotype. However, the virulence of strains deleted for caPLB1, as assessed in a murine model for hematogenously disseminated candidiasis, was significantly attenuated compared with the isogenic mild-type parental strain. Although deletion of caPLB1 did not produce any detectable effects on candidal adherence to human endothelial or epithelial cells, the ability of the caplb1 null mutant to penetrate host cells was dramatically reduced. Thus, phospholipase B may well contribute to the pathogenicity of *C. albicans* by abetting the fungus in damaging and traversing host cell membranes, processes which likely increase the rapidity of disseminated infection.

18/3,AB/13 (Item 3 from file: 440)  
DIALOG(R) File 440:Current Contents Search(R)  
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09439010 References: 32  
TITLE: Cloning and characterization of CAD1/AAF1, a gene from *Candida albicans* that induces adherence to endothelial cells after expression in *Saccharomyces cerevisiae*  
AUTHOR(S): \*Fu Y\*\*\*; \*Filler SG\*\*\*; Spellberg BJ; Fonzi W; \*Ibrahim AS\*\*\*;  
Kanbe T; Ghannoum MA; Edwards JE (REPRINT)  
CORPORATE SOURCE: UNIV CALIF LOS ANGELES, LOS ANGELES CTY HARBOR MED CTR, ST JOHNS CARDIOVASC RES CTR, DEPT MED/TORRANCE//CA/90502 (REPRINT); UNIV CALIF LOS ANGELES, LOS ANGELES CTY HARBOR MED CTR, ST JOHNS CARDIOVASC RES CTR, DEPT MED/TORRANCE//CA/90502; UNIV CALIF LOS ANGELES, SCH MED/LOS ANGELES//CA/90024; GEORGETOWN UNIV, DEPT MICROBIOL & IMMUNOL/WASHINGTON//DC/20007; NAGOYA UNIV, SCH MED, DIS MECHANISM & CONTROL RES INST, MED MYCOL LAB/NAGOYA/AICHI 466/JAPAN/  
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PUBLICATION: INFECTION AND IMMUNITY, 1998, V66, N5 (MAY), P2078-2084  
GENUINE ARTICLE#: ZL243  
PUBLISHER: AMER SOC MICROBIOLOGY, 1325 MASSACHUSETTS AVENUE, NW,  
WASHINGTON, DC 20005-4171  
ISSN: 0019-9567  
LANGUAGE: English DOCUMENT TYPE: ARTICLE  
ABSTRACT: Adherence to the endothelial cell lining of the vasculature is probably a critical step in the egress of *Candida albicans* from the intravascular compartment. To identify potential adhesins that mediate the attachment of this organism to endothelial cells, a genomic library from *C. albicans* was used to transform a nonadherent strain of *Saccharomyces cerevisiae*. The population of transformed yeasts was enriched for highly adherent clones by repeated passages over endothelial cells. One clone which exhibited a fivefold increase in endothelial cell adherence, compared with *S. cerevisiae* transformed with vector alone, was identified. This organism also flocculated. The candidal DNA fragment within this adherent/flocculent organism was found to contain a single 1.8-kb open reading frame, which was designated CAD1. It was found to be identical to AAF1. The predicted protein encoded by CAD1/AAF1 contained features suggestive of a regulatory factor. Consistent with this finding, immunoelectron microscopy revealed that CAD1/AAF1 localized to the cytoplasm and nucleus but not the cell wall or plasma membrane of the transformed yeasts. Because yeasts transformed with CAD1/AAF1 both flocculated and exhibited increased endothelial cell adherence, the relationship between adherence and flocculation was examined. *S. cerevisiae*

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expressing either of two flocculation phenotypes, Flo1 or NewFlo, adhered to endothelial cells as avidly as did yeasts expressing CAD1/AAF1. Inhibition studies revealed that the flocculation phenotype induced by CAD1/AAF1 was similar to Flo1. Thus, CAD1/AAF1 probably Encodes a regulatory protein that stimulates endothelial cell adherence in *S. cerevisiae* by inducing a flocculation phenotype. Whether CAD1/AAF1 contributes to the adherence of *C. albicans* to endothelial cells remains to be determined.

18/3,AB/14 (Item 4 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
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08184856 References: 39

TITLE: Cloning and characterization of a gene (LIP1) which encodes a lipase from the pathogenic yeast *Candida albicans*  
AUTHOR(S): \*Fu Y\*\*; \*Ibrahim AS\*\*; Fonzi W; Zhou X; Ramos CF; Ghannoum MA (REPRINT)

CORPORATE SOURCE: UNIV CALIF LOS ANGELES,MED CTR, DEPT MED, ST JOHNS CARDIOVASC RES CTR, DIV INFECT DIS/TORRANCE//CA/90509 (REPRINT); UNIV CALIF LOS ANGELES,MED CTR, DEPT MED, ST JOHNS CARDIOVASC RES CTR, DIV INFECT DIS/TORRANCE//CA/90509; GEORGETOWN UNIV,MED CTR, SCH MED, DEPT MICROBIOL & IMMUNOL/WASHINGTON//DC/20007; CASE WESTERN RESERVE UNIV,UNIV CTR MED MYCOL, DEPT DERMATOL/CLEVELAND//OH/44106; CASE WESTERN RESERVE UNIV,MYCOL REFERENCE LAB, DEPT DERMATOL/CLEVELAND//OH/44106; UNIV HOSP CLEVELAND,/CLEVELAND//OH/44106

PUBLICATION TYPE: JOURNAL

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GENUINE ARTICLE#: WH225

PUBLISHER: SOC GENERAL MICROBIOLOGY, MARLBOROUGH HOUSE, BASINGSTOKE RD, SPENCERS WOODS, READING, BERKS, ENGLAND RG7 1AE

ISSN: 1350-0872

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ABSTRACT: Extracellular phospholipases are demonstrated virulence factors for a number of pathogenic microbes, The opportunistic pathogen *Candida albicans* is known to secrete phospholipases and these have been correlated with strain virulence. In an attempt to clone *C. albicans* genes encoding secreted phospholipases, *Saccharomyces cerevisiae* was transformed with a *C. albicans* genomic library and screened for lipolytic activity on egg-yolk agar plates, a traditional screen for phospholipase activity. Two identical clones were obtained which exhibited lipolytic activity. Nucleotide sequence analysis identified an ORF encoding a protein of 351 amino acid residues. Although no extensive homologies were identified, the sequence contained the Gly-X-Ser-X-Gly motif found in prokaryotic and eukaryotic lipases, suggesting a similar activity for the encoded protein. Indeed, culture supernatants from complemented yeast cells contained abundant hydrolytic activity against a triglyceride substrate and had no phospholipase activity. The data suggest that *C. albicans*, in addition to phospholipases, also has lipases. Southern blot analyses revealed that *C. albicans* may contain a lipase gene (LIP) family, and that a lipase gene(s) may be present in *Candida parapsilosis*, *Candida tropicalis* and *Candida krusei*, but not in *Candida pseudotropicalis*, *Candida glabrata* or *S. cerevisiae*. Northern blot analyses showed that expression of the LIP1 transcript, the cloned gene which encodes a lipase, was detected only when *C. albicans* was grown in media containing Tween 80, other Tweens or triglycerides as the sole carbon source, and not in Sabouraud Dextrose Broth or yeast/peptone/dextrose media. Additionally, carbohydrate

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supplementation inhibited LIP1 expression. Cloning this gene will allow the construction of LIP1-deficient null mutants which will be critical in determining the role of this gene in candidal virulence.

18/3,AB/15 (Item 5 from file: 440)  
DIALOG(R)File 440:Current Contents Search(R)  
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06876777 References: 22  
TITLE: IN VITRO DETERMINATION OF OPTIMAL ANTIFUNGAL COMBINATIONS AGAINST CRYPTOCOCCUS NEOFORMANS AND CANDIDA ALBICANS  
AUTHOR(S): GHANNOUM MA; \*FU Y\*\*\*; \*IBRAHIM AS\*\*\*; MORTARA LA; SHAFIQ MC; EDWARDS JE  
CORPORATE SOURCE: UNIV CALIF LOS ANGELES, MED CTR, ST JOHN CARDIOVASC RES CTR, DEPT MED, DIV INFECT DIS, BLDG RB2/TORRANCE//CA/90509 (Reprint); UNIV CALIF LOS ANGELES, SCH MED/LOS ANGELES//CA/90024; UNIV CALIF DAVIS, DEPT MOLEC & CELLULAR BIOL/DAVIS//CA/95616  
PUBLICATION: ANTIMICROBIAL AGENTS AND CHEMOTHERAPY, 1995, V39, N11 (NOV), P 2459-2465  
GENUINE ARTICLE#: TD129  
ISSN: 0066-4804  
LANGUAGE: ENGLISH DOCUMENT TYPE: ARTICLE

ABSTRACT: There is currently no rapid, reliable, and reproducible in vitro technique to describe the growth-inhibitory interactions of antifungal drug combinations over a wide range of drug concentrations. We have developed a microdilution plate assay that was used to determine optimal drug combinations and concentrations of one-, two-, and three-drug regimens of amphotericin B (AmphB), fluconazole (FLU), and 5-fluorocytosine (5FC) for growth inhibition of three isolates each of Cryptococcus neoformans and Candida albicans. These growth inhibition data were then used in a multifactorial design technique to (i) generate contour and surface response plots to aid visual interpretation and (ii) develop mathematical equations describing the growth responses of the fungi to a wide range of antifungal concentrations and ratios. Our data indicated that (i) antifungal drug-drug interactions affecting yeast growth are complex functions of the drugs used in combination, their absolute concentrations, and also their relative (proportional) concentrations; (ii) AmphB-FLU combinations had additive effects against C. albicans over wide concentration ranges for each agent but were indifferent (i.e., were less than additive) in their inhibitory effect on C. neoformans; (iii) other two-drug combinations (FLU-SFC or AmphB: 5FC) had indifferent effects on the growth of both fungi; and (iv) three-drug combinations (AmphB-FLU-5FC) showed an additive inhibitory effect on the growth of both C. albicans and C. neoformans. The finding that no antagonism was observed in combinations employing AmphB and FLU in this in vitro model is of critical importance since it argues against the current theoretical concept, based on the individual drug's mode of action, of antagonism between these two drugs. These microdilution techniques provide a method to determine rational regimens of antifungal agents in multidrug combinations for future testing to correlate in vitro activity with in vivo response. The use of this approach has made the evaluation of complex antifungal drug-drug interactions possible and provided important new information to the evolving field of antifungal drug combination.

18/3,AB/16 (Item 6 from file: 440)

Searcher : Shears 308-4994

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DIALOG(R)File 440:Current Contents Search(R)  
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04082827 References: 20

TITLE: SUSCEPTIBILITY TESTING OF CRYPTOCOCCUS-NEOFORMANS - A MICRODILUTION TECHNIQUE

AUTHOR(S): GHANNOUM MA; \*IBRAHIM AS\*\*\*; \*FU Y\*\*\*; SHAFIQ MC; EDWARDS JE; CRIDDLE RS

CORPORATE SOURCE: UNIV CALIF LOS ANGELES, MED CTR, DEPT MED, DIV ADULT INFECT DIS/TORRANCE//CA/90509 (Reprint); UNIV CALIF DAVIS, DEPT BIOCHEM & BIOPHYS/DAVIS//CA/95616; UNIV CALIF LOS ANGELES, SCH MED/LOS ANGELES//CA/90024

PUBLICATION: JOURNAL OF CLINICAL MICROBIOLOGY, 1992, V30, N11 (NOV), P 2881-2886

GENUINE ARTICLE#: JU856

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LANGUAGE: ENGLISH DOCUMENT TYPE: ARTICLE

ABSTRACT: We studied a series of test conditions in a microtiter system to define the optimal method for determining the susceptibility of Cryptococcus neoformans to antifungal agents. Twenty-one isolates of C. neoformans were grown for 24 or 48 h in four chemically defined media: yeast nitrogen base (BYNB 7); RPMI 1640; synthetic amino acid medium-fungal (SAAMF), buffered at pH 7.0 to select the medium that best supported growth of this fastidious yeast; and yeast nitrogen base, pH 5.4 (YNB 5.4). Maximum growth of C. neoformans, at 35-degrees-C, was obtained in YNB 5.4, with the next highest growth levels in BYNB 7, SAAMF, and RPMI. Growth at 24 h was uniformly poor in all media and lacked reproducibility. In contrast, incubation for 48 h gave adequate growth with low standard deviations, and 48 h was selected as the optimal incubation period for this study. Comparison of the relationship between growth-kinetics and initial inoculum size for eight cryptococcal isolates showed that 10(4) cells per ml yielded optimal growth in BYNB 7 and YNB 5.4, whereas 10(5) cells per ml was optimal in RPMI and SAAMF. Furthermore, variation of inocula from 10(3) to 10(5) cells per ml showed small but significant inoculum effects in determining MICs of fluconazole, amphotericin B, and flucytosine for C. neoformans. Therefore, 10(4) cells per ml was chosen as the optimal inoculum for susceptibility testing in this study. Mean MICs of fluconazole, amphotericin B, and flucytosine for 21 cryptococcal isolates in RPMI and BYNB 7 were low (for example, fluconazole had mean MICs of 1.2 and 1.3 mug/ml in RPMI and BYNB 7, respectively) and differed significantly from medium to medium. In contrast, the MICs obtained in SAAMF were significantly higher (e.g., fluconazole had a mean MIC of 2.2 mug/ml). Variance in MICs was large with fluconazole and flucytosine but small with amphotericin B, irrespective of the medium used. A microtiter system employing BYNB 7 as the medium, 48 h as the incubation period, and 10(4) cells per ml as the final inoculum is a simple, accurate, and reproducible method for the testing of C. neoformans susceptibility to fluconazole, amphotericin B, and flucytosine.

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